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CERTAIN NUTRITIONAL ASPECTS OF HIGH EXTRACTION WHEATEN FLOURS

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THE wheat berry contains approximately 86 parts of endosperm, 2 parts of germ and 12 parts of clean bran (or seed coat[1]). Theoretically therefore it should be possible to mill an 88% extraction flour which would be white or creamy. In practice however a flour above 70% extraction contains an appreciable amount of bran, although improved purification methods in the milling of Canada Approved flour of 77% extraction can now give a flour containing very little bran (less than 1%). Likewise, although the average percentage of bran in the National flour of Great Britain (85% extraction) is about 4%, some of the flour being milled only contains half of that amount.

DIGESTIBILITY

Bran prepared in the milling of white flour may contain as much as 40% attached endosperm. The digestibility of endosperm in terms of energy is about 98%, whilst the figure for clean or pure bran (*i.e.*, including the aleurone layer* but without endosperm) is less than 20%. This low figure suggests that particles of bran pass through the gut substantially unchanged, except for the digestion of adhering endosperm and probably the aleurone layer. The water soluble vitamins in the bran will also be leeched out.[2]

The digestibility of a high extraction flour will depend largely on the percentage of bran, *i.e.*, on the insoluble fibre content of the flour. An analysis of the figures obtained by Macrae *et al.*[3] for the digestibility of white and wholemeal flours indicated that there is a linear relationship between fibre content and digestibility, each increase of 0.2 in fibre content decreasing the digestibility by 1.1%.[2] The following are typical figures:

	%	%	%	%	%
Fibre Content	0.15	0.55	0.95	1.55	2.15
Digestibility	96.0	93.9	91.7	88.5	85.2

The average fibre content of whole wheat is about 2.1% so that the digestibility of wholemeal flour is approximately 85% compared with 96 to 98% for white flour. Representative figures for 90 and 95% extraction flours would be 91.5 and 89% respectively, but the precise figure in each case can only be deduced from the observed fibre content of the flour.

The total energy in wheat and high extraction flours is constant at 342 calories per 100 gm. (calculated on 15% moisture basis). The percentage digestibility of the protein in these flours will be sensibly the same as for energy.

The size of the bran particles does not affect their digestibility.[3] On the other hand, the British Medical Research Council, presumably having in mind people suffering from digestive troubles, advised that all coarse bran (particles greater than 0.5 mm. cross section) should be excluded from the National flour milled in Great Britain. They also advised that the remaining particles of bran should not have a cross section greater than 0.2 mm. Incidentally, the Council also declared that National flour, which now contains on the average 4% of bran, and a supplement of calcium carbonate was not harmful to people suffering from any disease.[4] The nutritional quality of this National flour is under detailed continuous observation.[5]

* The aleurone layer is the innermost layer of the seed coat. It amounts to about 3% by weight of the grain and is believed to be rich in minerals and other nutritive factors.

PROTEIN CONTENT

With increasing extraction the percentage of protein increases, but at 85% extraction it is sensibly the same as for whole wheat. The following figures were obtained on an all-Manitoba grist milled to different extractions on a laboratory mill but the same general result has been obtained on commercially milled samples:

Extraction	*Protein*	*Ash*	*Fibre*
Wholemeal	13.6%	1.53%	2.15%
85% Flour	13.6	0.75	0.35
80% "	13.2	0.59	0.15
75% "	13.0	0.44	0.10
70% "	12.8	0.41	—
42% "	11.8	0.34	—

There is some evidence that the outer portion of the endosperm contains a higher percentage of protein and also that this protein has a higher biological value than that in the mass of the endosperm. There is no indication that an 85% extraction flour, as milled in Great Britain, contains appreciable amounts of detached aleurone layer and in fact all experience shows that it is most difficult to remove this layer from the bran by modern milling processes.

PHYTIC ACID AND CALCIUM AND IRON ABSORPTION

Bran is rich in phytic acid. The following are typical figures.[6]

Sample (dry basis)	*Total P mgm. per 100 gm.*	*Phytate P mgm. per 100 gm.*	*Phytate P as % of total P*
Manitoba wheat	381	274	72
Relatively clean bran	1,609	1,439	89
" " germ	1,413	674	48
White flour (70% extraction)	121	38	31
National flour (85% extraction)	238	136	57

McCance and Widdowson[7] in experiments on adults have shown that phytic acid interferes with the absorption of calcium from the diet as a whole, the calcium salt being practically insoluble at the pH of the intestine. On the basis of their experiments the Medical Research Council advised[8] that a supplement of a calcium salt (they indicated calcium carbonate although presumably other soluble calcium salts would do equally well) should be added to all high extraction flours; in the case of National flour of 85% extraction they advised that the addition should be 14 oz. of the carbonate to each sack of 280 lb. of flour, *i.e.*, 125 mgm. of calcium per 100 gm. of flour. The desirable addition will depend not only upon the total calcium in the diet, and particularly upon the quantity of milk consumed, but also upon the quantity of flour consumed and the bran content of this flour. The calcium content of the drinking water must also be considered.

Taking into account all these considerations the British Ministry of Food ultimately decided to add only half the quantity of calcium carbonate suggested by the Medical Research Council and since August, 1943, all the National flour milled in Great Britain contains 7 oz. of calcium carbonate per sack (62.5 mgm. of Ca. per 100 gm. of flour). The justification for this amount has been reported.[9] The type of calcium carbonate is washed native chalk (creta præparata B.P.) which was found to be more satisfactory than any other form of calcium carbonate largely because it has no effect on the pH of the bread.[10] It is also a well defined pure chemical product with limits for lead and arsenic.

A 100% wholemeal would require the addition of approximately 250 mgm. of Ca. to each 100 gm. of flour, otherwise the high content of phytic acid in the flour would have a marked effect on calcium absorption. It is therefore of some interest to note that in Eire, where until recently a 100% wholemeal flour was general, the incidence of rickets, particularly in Dublin, has increased significantly.[11] The flour was not enriched with calcium.

McCance and Widdowson have also shown that phytic acid reduces iron absorption,[2] but it is not yet clear if a high extraction flour, suitably enriched with calcium to precipitate phytic acid and thus to ensure adequate calcium absorption, has the same effect on iron absorption. It is unlikely, but further experiment is wanted to clear up the point, and experience in England will be most helpful. The total iron in flour increases with extraction. Thus representative figures for the iron content of wheat and the 85 and 75% extraction flour milled from it are 4.1, 2.4 and 1.4 mgm. per 100 gm. (expressed on 15% moisture basis). High extraction flours are also rich in potassium and magnesium.

Phytic acid serves at least one useful purpose. Wheat contains 1 p.p.m. of lead[13] so that the person consuming large quantities of wholemeal

bread or bran (content 3 p.p.m.) might in time suffer from mild lead poisoning were it not for the fact that the lead is almost certainly present as insoluble lead phytate. Again, in bread-making with high extraction flours some 60% of the phytic acid is hydrolyzed to give an equivalent amount of inositol, a fact which may be of some nutritional importance. In white bread all the phytic acid is hydrolyzed during the baking so that no calcium addition is required.

THIAMIN IN GERM

An important development in the nutrition of high extraction flours was made by Hinton[14] who found that whereas the thiamin content of the embryo portion of the germ was of the order of 4 I.U. per gram, that of the scutellum was about ten times this figure. He has since extended this work[15] and from a wider survey of wheats has found the thiamin content of the scutellum to range between 40 and 70 I.U. per gram, and that of the embryo from 1.4 to 8.1 I.U. per gram. The weights of the embryo and scutellum portions of the germ average 1.2 and 1.5% respectively of the whole grain, which means in turn that these two fractions contribute 3 and 59% respectively of the total thiamin in the wheat. It is clear therefore that to obtain a flour of high thiamin content the milling should be so regulated that the bulk of the scutellum is included in the flour. This is the explanation for the high content in English National flour in which it averages 1.0 I.U. per gram and is probably the explanation for the relatively high content of thiamin in Canada Approved flour. Hinton has also found certain marked differences between scutellum and embryo in respect of other factors, *e.g.*, the scutellum is much richer in phosphorous and phytic acid than the embryo.

OTHER VITAMINS

The microbiological technique developed by Snell and his associates[16] has provided satisfactory methods for the estimation of the other B vitamins. These methods are being developed in their application to cereals[17] but the following are recent figures for riboflavin and nicotinic acid obtained at the Cereals Research Station, St. Albans, of the British Ministry of Food.

Sample	*Riboflavin ug/gram*	*Nicotinic acid ug/gram*
Manitoba wheat	1.7	55.0
85% flour (same grist) .	1.0	13.0
80% "	0.8	11.0
75% "	0.7	9.5
70% "	0.7	8.5
42% "	0.5	7.0
Bran as milled	6.0	300-350
Germ as milled	15.0*	30.0

* Same value for scutellum and embryo.[14]

The 85% flour had a low fibre content—0.35%. Normally, 85% National flour has average riboflavin and nicotinic acid contents of 1.5 and 20 ug/gram respectively.

It would appear from these figures that because the germ forms such a small fraction of the wheat berry that it is the bran which is the main source of the riboflavin and nicotinic acid in high extraction flours and that a "white" high extraction flour will be relatively poor in these two factors but rich in thiamin. Although precise figures are not available this is probably also true of pyridoxine and pantothenic acid.[18] Work is also in progress on the estimation of vitamin E in the different parts of the wheat berry. The evidence is that this vitamin is contained in appreciable amounts even in the endosperm.[19] The desirable standards for a high vitamin flour for a particular community will of course depend upon the nature of the rest of the diet, although a high content of thiamin will be essential.

CONCLUSIONS

Because of the emphasis on the nutritional quality of foodstuffs, research during the war period has added considerably to our knowledge of the structure and chemistry of the wheat berry. Further, the nutritional quality of a flour can now be stated in reasonably precise terms. We may confidently expect a further fruitful period of research covering not only improved methods of vitamin assay and varietal studies aiming at producing wheat of the highest nutritional quality but also the obvious gaps in our knowledge, *e.g.*, the importance of the aleurone layer and outer endosperm in the milling of high vitamin flours.

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RÉSUMÉ

A cause de l'importance que l'on apporte depuis la guerre à la valeur nutritive des aliments, nous avons étudié davantage la formule physico-chimique du blé, et nous pouvons maintenant déterminer la valeur alimentaire d'une farine avec précision. La détermination vitaminique des farines est bien établie et nous commençons à combler d'autres lacunes. Nous connaissons mieux l'importance des diverses enveloppes du blé, notamment de sa cuticule. On s'efforce de moudre un blé à la fois hautement vitaminé et très nutritif.

JEAN SAUCIER

JOB MISFITS — WORK CONDITIONS*

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I SHOULD like to start our discussion of this matter by saying that none of us find that our jobs fit us perfectly. Finding the man who is perfectly fitted for his job reminds me of the King who, in ancient times, was told that if he would be cured he must wear the shirt of a perfectly happy man. After prolonged search a man was found who declared that he was perfectly happy; wanted no more money, no more friends and no greater power. Unfortunately he had no shirt!

This fact that the adjustment between the man and his job is not a perfect one is given recognition in the phrases we use to describe the process of taking over a new position. We talk about the new worker being broken in, being initiated, or shaking down in his job.

Even when this preliminary process is over we shall be wise if we keep in mind that the relation between the man and his job is a dynamic and not a static one. The demands of the job in its wider sense are always changing; the man himself is under constant adjustment, not only to the job situation but to that much larger and usually much more significant part of his life which is carried on outside his place of work. We shall have occasion constantly to return to this most important fact, namely, that if we are to understand the worker we must study the man. You cannot be satisfied to conceive of him becoming a worker when he enters the factory gates and becoming the head of the family when he passes back through them in the evening. These two aspects of his life necessarily interpenetrate and profoundly affect each other.

Before dealing with the difference which particular work conditions may cause, let us stand back from the multitudinous problems of the adaptations of individual men to a great complexity of jobs and attempt to identify certain broad general trends.

By viewing a longer time period than the immediate present it is possible to see that many of the groups of problems which confront us are of recent origin. Industry is not synonymous with work, for men have always worked. When steam was first harnessed however, the relationship of men to their work began to undergo a rapid change. For an unknown period of time men had been adjusted to a way of work which, while containing many different varieties of activity, may be designated as follows: It was considerably diversified; it was complete in itself, *i.e.*, he started something and carried it through to conclusion whether it was plowing a field, building a boat, or making a pair of shoes; it was carried out for the most part within the family group or in close association with it. The work groups were small, the workers tended to live in small communities, mostly rural.

With the harnessing of power to industry, changes were set in motion which have pro-

* From the series of lectures on "Human Behaviour and its Relation to Industry", given at McGill University, 1944.

foundly affected not only the conditions of work but also the conditions under which the worker lives. The amount of work, the tempo at which it is carried out, the work group, the family and the neighbourhood have undergone extensive change and these changes express themselves in the adjustments of the individual worker. It is, therefore, necessary, constantly to bring in to one's thinking the fact that the man at work in these days is adjusting himself to a situation which is radically different from that in which mankind grew up and to which he became adapted over a period of thousands of years.

FRAGMENTATION

One of the first consequences of the industrialization of work has been the division of production into a series of operations. This division is based upon the technical requirements of the task, and indeed bears no relation to its meaningfulness for the worker. This forms the theme of a radio song which many of you may have heard Gracie Fields sing. It deals with the girl who makes the what-you-may-call-it which pushes the whosis that turns the thing-um-a-bob that makes the engine roar. This, by the way, is rather interesting, not only for its recognition of the meaninglessness of many industrial operations, but also for its attempt to give them meaning by relating them to the major end result, in this instance to making "the engine roar". The worker may react to this meaninglessness in several ways, first and most constructively by attempting to attach meaning to the operation. We have all encountered this in our own experience. Where the task is repetitious we have endeavoured to break up the series by dividing it into blocks of five or ten or fifty. We have introduced a competitive element by setting up time limits or by checking the number of errors we make in each block, or, if the operation is accompanied by repetitious sounds, we have attempted to set them to some tune.

Where these measures are not satisfactory and where the worker does not require to devote all his attention to the job, he will still attempt to externalize his interest through conversations or other social contacts with his fellow workers.

I had occasion recently to see two patients who came to consult me suffering from the effects, among other things, of repetitious monotonous work. The first one was a man who was extremely anxious and "edge-y", he was not sleeping well, he was irritable and was unable to concentrate for any length of time. He blamed this, to some extent at least, on his work, and when one inquired of him what his work was, he said he had to make small parts. The job consisted in his being given a blueprint to set up his machine to manufacture certain small parts, and once his machine was set up, it would sometimes run for weeks or even months making the same part every two or three or four minutes. I asked him how that affected him, and he said it wasn't so bad when he was actually setting up the machine to make the part, but once it was going and kept going for several hours he became increasingly fidgety, and after it had been going for several weeks it was almost more than he could stand to work it. I asked him if that was a common experience, and he said "yes". I said, "What means do the workers take to help out a situation of that kind?" He said, "Well, we are allowed to talk, and we spend a good deal of time talking. As a matter of fact, it is recognized that no one can stand indefinitely the extraordinary repetitiousness and monotony of this work, and we are allowed to shut off the machine every now and then and take a few minutes off, and then start up again."

The second case is very much the same kind of thing. This was a girl who was rather depressed, but there were other causes for her depression. She had the somewhat inevitable trouble with the "boy friend"; but in addition to that, she said that her work bothered her a good deal. She was engaged in making patterns with an electric embroiderer. She made two hundred such patterns a day, and she said she found, especially of late, that the effects of the work were very bad. When she had been doing it a little while she would get very mad and irritable, and she could not get any relief in conversation because that spoiled her concentration. She too would shut down her machine, as also the other girls were allowed to do, and the manager said she could take a little walk and come back again and start up once more. This kind of work, long continued, has a very definitely adverse effect upon the stability of the worker.

I mentioned that this type of work might be productive of tensional states, and I have illustrated that by these two cases. It may also be productive of what we term obsessive thinking.

This consists essentially of a prolonged mulling-over of past happenings. Slights and old grievances are gone over and over and in this way are kept remarkably vivid and fresh in the mind of the worker. All those who have at any time worked in a supervisory capacity have been startled to discover the depth of feeling which some worker has shown concerning some matter which has come up between them a considerable time ago and which has not been settled to the satisfaction of the worker.

This obsessive type of thinking is usually accompanied by some degree of depression and by a lowering of output. The term "obsessive" is rather unfortunate, and I use it simply because it is already well established. It should be clearly understood however, that it is not related to the thinking shown by the person who suffers from an obsessive neurosis. In this latter the patient, against his wishes, finds unpleasant and disturbing thoughts coming into

his mind in a repetitious manner. The obsessive thinking of the worker, where it is carried to extremes, tends rather to the development of feelings of persecution which, in a few instances, may evolve into actual delusions.

Such progression is, however, by far the lesser part of the problem. In the vast majority of instances, the major result is unhappiness, dissatisfaction with the job, griping at the supervisor and the management, leading to poor morale and an increased labour turnover.

At this point I should like to emphasize the great importance of the externalization of interest. This is a principle of the utmost value, which has wide application. Not only is it necessary for the preservation of good mental health, but it is also used as a therapeutic weapon in the treatment of those who have developed behavioural disorders. It is widely applied in occupational therapy centres, both in civilian and in military hospitals.

A final point should be made concerning this matter of fragmented, repetitious work. As can be readily understood, the more intelligent the worker, the more rapidly and completely he will master the skill necessary for carrying out the operation; consequently, the more attention he will have left over for adjustment elsewhere. If this can be adequately externalized well and good. In general it may be said, however, that those of lesser intellectual endowment are better adapted to carrying out simple repetitious work. Existence of obsessive thinking or of behavioural disturbance is considerably less among such workers.

I will try to illustrate this by the case of a patient whom I saw for some time in Albany. She came from a little town about sixty miles away, and she was asked to come down and see us by her insurance company because of a very disabling trait which she had, namely a slight rotation of her head towards the left. Interestingly enough, as became apparent in a very short time, this movement only occurred when she brought her hands together or raised them up to about breast level. On inquiry it became clear what this was related to. This woman worked in a paper bag factory, and during the course of the day she at times had to produce what seemed to me to be an enormous number of bags, namely eighteen thousand; and each bag, she claimed, was a separate operation. What she had to do was to pick up the semi-completed bag with the left hand, feed it into the machine, watch its progress by turning her head, and then pull it out on the other side. After this had gone on for many, many years she began to feel an aching at the back of her neck, and subsequently this embarrassing condition occurred. It was very awkward. She could not go down town because, as soon as she raised her hands to pass something over the counter, her head turned to the left. She had discovered a little time afterwards that if she gave her head the slightest bit of support with her finger it would not turn; but that gave her an extremely coy look; and although she was a woman in her fifties, it was a small town and a little gossipy.

That was one of the factors. Interestingly enough, there were a whole series of other factors which were brought out over a period of time. We had quite a number of interviews with her. Some of the other factors require mentioning. The first one was this, that she did not like the factory, that she felt it was to some extent a lowering of her social status to be a factory worker. Her father had been a minister, and she had married a foreman in this factory, and had gone in there to work shortly after the marriage, very much against the wishes of her mother, and ever since then had held herself somewhat aloof. She was, as she said, "very nice" to the other workers during the day, but in the evening hours she had an entirely different set of friends. The second point of importance was this, that during the earlier part of her stay she got to know the manager pretty well and had quite a standing in the small factory. She was given the best job: it only carried a dollar a week more, that is she made $18.00 a week, whereas the other workers made $17.00, but it meant a great deal to her. However, at the time I saw her, her old friends had disappeared from the scene and she was just one of the group, and that hurt her a good deal.

The last thing which was of importance to her, and which undoubtedly contributed seriously to the production of this psychoneurotic reaction was the fact that one of her daughters, after being divorced, decided to come back to work and she came in to the factory, and, to the mother's consternation, at once was given exactly the same salary as the mother, who had been there for eighteen or twenty years. All these things were definitely too much for this lady; they all served to contribute to the production of this psychoneurotic mechanism.

SPECIALIZATION

A closely related problem is that of specialization. There is a tendency to call for more and more intense application of a lesser and lesser range of the individual's equipment. The earlier essentially rural occupations called for the daily use of a considerable range of the equipment of the individual. During the course of the day's work as a farm hand he might cut firewood, drive a team, milk the cows, or carry on any other variety of skills that such jobs require. Though the work admittedly is heavy, the diversity provided some degree of relaxation and prevented the development of undue tension.

Contrast this with the job of the switchboard operator or the telegrapher. Here there is no diversity, a narrow range of the individual's equipment is used intensely for prolonged periods of time, often at a tempo which is not set up by the worker but originates outside his control. It is of interest to note that such occupations have a relatively high rate of behavioural breakdown. Telegraphers' or writers' cramp is a condition which is now well known. It consists essentially of a spasmodic contraction of the muscles of that hand which is used by the worker and it occurs only when work is

undertaken. The telegrapher can light a cigarette, can tie his tie and put on his gloves with that hand, but he cannot use it to carry on his work.

I had occasion since I came to Montreal to see a man who had exactly that difficulty. He said, "It is most embarrassing to me. I come down to the job in the morning, and I can use the telephone, but if there is a heavy snowfall and the telephone line happens to be out of commission and I have to use the telegraph key, in a comparatively short period of time I "freeze up", and as a matter of fact I live pretty close to the place of work, and it is a small place, and I have my boy, who is about sixteen, come on and run it through for me on the sly; otherwise I would be 'out'."

In the case of the switchboard operator, apart from the tension, irritability, and feelings of anxiety which may develop in a few instances, deviations of behaviour similar to that shown by the telegrapher may develop. In the last few years we have had occasion to see several switchboard operators who have developed difficulty with their voices. Characteristically, this difficulty in speaking only appeared when working on the board.

In the field of general industrial medicine we have recognized the existence of dangerous trades and occupations and legislation has been passed to safeguard those who work, for instance, with lead or with abrasives. We have not yet recognized those occupations or, perhaps better, those conditions of work which are harmful from the behavioural point of view. I would suggest, however, that we might reasonably say that these occupations which demand intense utilization of a narrow range of the equipment of the individual create a degree of stress which may be harmful.

BASIC HABITS

At the outset of our discussion we said that the growth of modern industry had resulted in widespread changes in our pattern of living. This disturbance may be clearly seen in the changes which have tended to appear in certain of our basic habits. I shall refer to changes which have occurred in respect to our habits of eating, sleeping, and recreation.

First, let me say that we have perhaps been rather inclined to reject these as sources of possible disturbance in efficiency and behaviour. When the person who is not directly concerned with problems of human behaviour, thinks about the causes of disturbances in behaviour he is rather inclined to think of the great emotional crises — deaths, marital discords, sexual disasters, and loss of employment. Or if these do not fit into the picture he thinks, at least in the more severe disturbances, of the possibility of heredity. These matters of proper eating, sleeping and recreation, are such familiar things that they are usually passed over and their great influence upon efficiency and behaviour goes unrecognized. Actually, they are among the foundation stones upon which behaviour is erected.

First, with regard to habits of eating. At the outset it should be understood that the meal period serves two functions. First it permits of simple replenishment; it allows the individual to take in enough of the energy-producing foods to carry him through the next work period at a satisfactory level of production. Second, it has a psychological value, in that it provides a period for relaxation and for relief from tension. This latter is most important. It can then be readily understood that the circumstances under which the meal is taken can promote its value as a period of relaxation, or can destroy it. If the time is too short; if the worker has to stand in line for a large part of his meal period; if the surroundings are unattractive, the food poorly prepared and served, or if the eating place is noisy and crowded, the effects upon the worker, especially if he has come tense from hours of high speed, exacting work will be bad. If he cannot relax not only does he go back unrested but he cannot digest what he has eaten and his effectiveness is thereby reduced.

That is the general picture. Here are certain specific facts drawn primarily from the experiences of the Department of Labour in New York State. A study was made of the relation between meal-frequency and production, in a group of women engaged in sewing canvas tops for tennis shoes. Some were put on a two-meal schedule, omitting breakfast; others on a three-meal routine and some were given five meals, the two extra consisting of a light snack early in the third hour of the morning and of the afternoon periods.

Performance on the three-meal schedule was much better than on the two-meal routine and those who had five meals did slightly better than those who had three. It proved to be impossible to differentiate between the value of supplementary meals as a source of extra

energy and their value as a period of relaxation. We might point out, however, that the sugar in the blood, which is a source from which immediate demands for energy are met, tends to fall about three hours after a meal and rises again immediately after food is taken in, especially if the food contains a large amount of carbohydrate.

A word of warning concerning supplementary meals might be given at this point. In actual practice it has been found that the worker tends to make use very largely of carbohydrates in the supplementary meals and that he does not reduce the customary amount of carbohydrate at his usual meal times. Consequently, his total intake for the day tends to become unbalanced. It contains too much carbohydrate.

At this point I should like to emphasize the great importance of rest-periods, at least in high speed, repetitious, monotonous work. These are the occupations which tend to produce tension in the worker. It is impossible to over-emphasize the importance of severe and prolonged tension as a cause of behaviour breakdown. During the last several years I have seen a constant stream of men and women workers passing through my office, in whose personality breakdowns, excessive tension at work, played a notable part. This is a matter which I mean to discuss at length at my next lecture.

The second of the basic habits which tend to be disturbed is that of sleep. Disturbance of sleep habits among industrial workers may arise in several ways. First, because of the necessity of living in crowded quarters in the vicinity of a rapidly expanded war industry; second, through the necessity of working on the night shift.

Let us first review some of the effects of inadequate sleep. Few people realize how serious this may be. It is, for instance, possible to live several times longer without any food whatsoever than without any sleep. Recent surveys have shown that the loss of a full night's sleep results in a considerable loss of efficiency on pychological tests, and loss of even two hours results in the requirement of the expenditure of considerably more energy in the carrying out of most tasks than is customary. It is possible that the negative results which were reported earlier concerning the effects of loss of sleep upon the psychological tests were due to failure to take into account the fact that the individual could bring his efficiency temporarily up to its former level by the expenditure of an extra effort. When that effort is measured at the same time as the test is being performed, the fact of his potential inefficiency can be brought out.

The effects of long-continued loss of sleep can be well illustrated by the rather extreme case of a young man who conceived the idea that sleep was just a bad habit and that though it was admittedly hard to break, once it had been overcome it would be possible to live a much fuller life. He succeeded in gaining the interest of a large research institution and was admitted to carry through his experiment under controlled conditions. With the assistance of the staff he succeeded in keeping awake for two hundred and thirty-one hours, nearly ten days. During the latter period he became progressively forgetful and his attention could not be held for more than a few minutes. He grew quite emotionally unstable, was irritable, suspicious and antagonistic. He accused the staff, during the last day or two, of trying to interfere with his efforts and eventually developed actual delusions and hallucinations. In consequence of this the project had to be abandoned. After 48 hours' sleep he showed considerable improvement, and finally returned to normal.

This is of course a much more acute loss of sleep than we are concerned with, but it is important to recognize that the repeated loss of an hour or two at night can be serious if long continued.

As indicated earlier, one of the more important factors in the interference with the sleep habit consists in the necessity of working on the night shift. Interference arises both because of the difficulty in altering the sleep rhythm and because of the fact that the home life is geared to daytime work. The third factor consists in the difficulty of getting adequate recreation for the night-shift worker.

Exhaustive studies have been carried out, both with regard to the current practice of shift rotation and with regard to the most desirable practice. The following points are agreed upon. First, prolonged night work under, unsatisfactory conditions which still generally prevail is undesirable. Second, rapid

rotation, say after a week, while widely practised, is also undesirable. It gives the worker little opportunity to adjust either his sleep rhythm or his home life. Night-shift work is especially difficult for two categories of worker—those under twenty-one years of age and women. Third, if free choice is given there is a tendency for the less efficient worker to gravitate to the night shift. Fourth, it is now recognized that certain individuals tend to adjust more easily to night work than others. Those who adjust well are those whose highest level of efficiency tend to be attained in the latter part of the day. Such persons describe themselves as dull, and lazy in the morning, find it hard to get up but, as they say, tend to wake up as the day progresses and are bright and active in the evening hours. They like to sit up late and at school find it easy to study late. The other group are at their best in the earlier part of the day. They wake up early; they are bustling and interested in the earlier part of the day, but towards evening they feel sleepy and usually like to get early to bed. This group does not adjust well to the night shift.

The existence of these two groups is now therefore well established and the National Research Council in the United States has brought out a recommendation that military officers should, where possible, select night workers, sentries and night drivers from the first group, namely, those who wake up slowly and are at their best in the latter part of the day.

The fifth point upon which there is general agreement is that the welfare and efficiency of the night-shift worker can be maintained at a higher level if the community in which he lives takes steps to meet his needs. Among these steps is the provision of recreation for him and perhaps more particularly for the worker on what has been described as the swing shift, namely, the man or woman who comes off work around midnight. Among other steps have been arrangements to assure quiet for him during the daylight hours. In certain cities, for instance, Paterson, N.J., the homes of night shift workers carry a special designation, and in other cities the police have been asked to assist in assuring quiet in given neighbourhoods. Among night duty nurses living in hospitals the problem is simplified by arranging that those on night work should sleep on certain separated floors in the nurses' home.

The third basic habit which may be disturbed is that of recreation. It is important at this point to clarify our minds concerning the part which recreation plays in the maintenance of efficiency. In the minds of some people there still persist some outdated ideas that recreation is something like the sugar coating on the cake, nice, but not really necessary. These beliefs have been carried over from a period when pleasure was considered to be naturally sinful.

As the tempo of industry is speeded up however, it has become progressively more widely recognized that recreation is a fundamentally important part of the individual's life. Without recreation his effectiveness within a short period begins to diminish and ultimately he may completely break down. It has also been recognized that certain types of people require more recreation than others.

Unfortunately, along with this recognition there has not gone a general grasp of the fact that certain types of recreation are of greater value than others. If you consider the great growth of recreation during the last century you will see that many of them have quite naturally conformed to the spirit of the period. There has been a most considerable growth of those recreations which are competitive, which require considerable skill and which are carried out at a rapid tempo. Indeed, one quite often hears one or other form of recreation recommended on the grounds that you can get so much of it in such a short period of time.

I will refer only in passing to those conditions of work which throw excessive strain on special parts of the individual, for instance, upon his hearing, or upon his visual equipment. Studies are constantly being carried out upon these matters. At present it is generally agreed that continuous loud sounds produce more rapid fatigue and lessened output. No information is available concerning the effects of distracting sounds or shrill and intermittent sounds. The earlier work upon industrial conditions and vision was mainly concerned with the effects of illumination upon behaviour. More recently, studies of eye-muscle fatigue have begun to bear fruit. As you are possibly aware, our eyes are a little like binoculars, in that we have to adjust them when we change from looking at far objects to looking at near-by ones. These changes are achieved by small muscles which act on the eye itself.

It has now been shown that if the work undertaken calls for constant alterations in the range of vision, fatigue sets in. This is exemplified by the fact that the telescopic rifle has been found to be much less likely to produce fatigue by the end of the day than did the older type where it was necessary first to look at the target, then get the front sight on to it and then look at the back sight so as to get all three lined up. With the telescopic rifle on the other hand, one simply looks directly at the target and no change in focus is necessary.

Thus far I have talked about the physical conditions of the job. There is, of course, another most important set of conditions, namely, the social conditions. Most of you are already familiar with the fact that the welfare of the individual and his efficiency can be greatly affected by the conditions under which he works. Sometimes it is one individual who is so affected; at other times it is a whole group of workers who are adversely affected.

In order to explain this it is necessary to refer to a fact which has been touched on in previous discussions, namely, the presence of an internal social structure in an industry, quite apart from the formal structure. People record this to each other in different ways from that which is recorded on paper. This internal structure is most important. Where it is weak or where it is definitely in conflict with the formal structure, behavioural disturbances may set in.

The last condition of work which I am going to mention may seem to contradict the title of the paper, since it concerns conditions outside the place of work entirely. As I indicated at the outset, however, we cannot understand the worker unless we understand the man. Consequently, it is necessary to keep constantly in mind the fact that things which affect him outside his working hours will undoubtedly influence his ability to work.

I shall not attempt to refer to all the situations which may cause difficulty for him in his home or in his neighbourhood, for these are all but innumerable. I shall instead refer to certain major trends from which many of these disturbing situations spring. Prominent among these trends is the friction between the younger members of the family and parents. This has been a cause of difficulty from time immemorial but in these last several decades it has become accentuated because of the fact that social change has been so rapid that the older members of the family often have unusual difficulty in achieving adjustment.

A second trend consists in the migration to urban centres from rural districts. Under these circumstances a considerable number of younger workers find themselves dislocated from their family groups without as yet having established families themselves. For some of them it is exceedingly difficult to integrate themselves into their new neighbourhoods and they become what has been well termed "isolates". This, in turn, has an adverse affect upon their stability, states of anxiety are apt to appear and personality breakdowns are not uncommon.

In conclusion I wish to say that perhaps the most important thing that I can communicate to you is the viewpoint of a worker as an individual, and as an individual who spends only part of his time at the job.

Those of us who have spoken to you and will speak to you—psychologists, sociologists and psychiatrists—are engaged continuously in the study of human behaviour and can give you factual material drawn from a great range of human activity, from studies carried out not only in industry but also with children; from investigations carried out in connection with those large groups of men and women who have entered the armed forces; work in the community and work in the hospitals. We can also offer you, from experience gained in these fields, methods of approaching problems as yet unsolved. But the application of that knowledge rests with you—with the nurses, personnel men, with the doctors and the executives who comprise this audience and who are in intimate daily contact with the matters with which this course of lectures was drawn up to deal.

As we are made continually aware, we are in the midst of a period of immense social change. These changes are widespread and are moving forward with the greatest rapidity. This rapidity and the sweeping nature of the changes bear heavily upon the individual and upon groups; adaptation is difficult and this difficulty expresses itself alike in the growing problems in the field of labour, in the increased juvenile delinquency rate and in the rising demand that the human factors should be recognized. In order to meet this, the joint exertions of all of us will be necessary in the highest degree.

RÉSUMÉ

Il est rare qu'un ouvrier soit parfaitement adapté à son emploi. Pour comprendre l'ouvrier il faut étudier l'homme en même temps que le manœuvre. Les grands changements survenus dans l'industrie ne sont pas étrangers au malaise actuel. L'ouvrier fait maintenant un travail fragmenté et monotone. Le genre actuel de travail a des répercussions sur la famille et le genre de vie du travailleur. Cette monotonie du travail crée souvent un état de tension nerveuse contre lequel il faut lutter par des moyens appropriés. Il faut compenser l'intensité de la tâche par des repos plus fréquents; il faut distraire l'ouvrier qui est très spécialisé. Il ne faut pas perdre de vue que le travailleur doit manger une nourriture adéquate, qu'il doit dormir convenablement et suffisamment et enfin, qu'il doit se distraire. L'ajustement de nombreuses conditions sociales par rapport à l'ouvrier de grande industrie doit porter sur les questions essentielles de la nutrition, du repos, des distractions et de l'hygiène mentale.

JEAN SAUCIER

ARTHRALGIA

By Lt.-Col. T. G. Heaton, R.C.A.M.C.

THE problem of joint pain without objective findings does not seem to have attracted much attention in civil life. But in military practice these cases are quite common. Among 942 consecutive patients seen during part of 1942 at an army medical diagnostic outpatient clinic, 53 men had joint pain as a major complaint. Of the 53, there were 26 men without objective evidence of joint disease at the time of examination or in any of their available military documents.

Some of these cases had been diagnosed as "arthritis" or "rheumatic fever" in spite of negative findings. In other cases the absence of objective evidence was reflected in such diagnoses as "myalgia" or "fibrositis". In some cases a diagnosis of "synovitis" was an apparent attempt to give an organic explanation of joint pain in the absence of objective evidence of arthritis. In a few malingering had been diagnosed or suspected. I should like to emphasize that this joint pain is not something peculiar to soldiers. Most of these cases had their origin in civil life. Because these cases are fairly common and because they are difficult to assess, and troublesome to treat, I feel that a review of these 26 cases of joint pain without objective findings may be helpful.

Age.—These men ranged in age from 19 to 58 years. Most were between 20 and 30 years of age.

Joints involved.—In 24 of the 26 cases, multiple joints were involved. The knees were probably most often affected. But none of the joints of the limbs was exempt. Cases of back pain and foot pain were, for the sake of simplicity, omitted from consideration in this series.

Two cases had pain in only one joint. In one of these the knee only was affected. This man had rheumatic fever in 1940 and dated his knee pain from this illness. He had well marked emotional instability. The other man had pain in one shoulder of five years' duration and was emotionally unstable with subnormal intelligence.

Functional nervous disorder.—Twenty-two of the 26 cases were noted as emotionally unstable. Of these, 7 were definitely psychoneurotic and 4 were of subnormal intelligence.

This association with functional nervous disorder is the outstanding fact in the series. But it was by no means always a fact that was obvious to the casual glance. In only one or two of these patients was there anything in the previous military documents to suggest that functional nervous disorder was contributing to their disability.

Of the four cases in which emotional instability was not diagnosed one seemed to me to be unstable in abnormal degree but the neuropsychiatrist would not agree (case 2 below). In another the records do not cover this aspect of the examination. A third patient had some digestive complaints considered to lack organic basis. The fourth did seem stable and had knee crepitus and complained of pain only in the knees. I did not think the crepitus was of the type considered significant of a lesion capable of causing pain.

"Neuralgic" pains.—Pains in the chest, abdomen, or limbs, apart from joints were associated with joint pain in 14 of the 26 cases. Such pains are referred to in the literature as "neuralgia", "submammary ache", "pleurodynia", "intercostal spasm", "fibrositis". This is not the place to discuss these terms. In no case in this series were nodules or sharply located tenderness found. A sufficiently non-committal name has not yet been devised for these pains whose mechanism I feel is still unknown. I have termed them "neuralgic" because this is a term in common use. The association of such pains with emotional instability has been pointed

out in a recent article, and indeed is well recognized.

Previous joint disease.—Six of these 26 cases gave a history of rheumatic fever which seemed authentic. These illnesses occurred in 1930, 1930, 1934, 1935, 1936, and 1940, respectively. In three cases the man dated the onset of joint pains from this illness (1934, 1935, 1940). In the other three the joint pain began 6 years, 11 years, and 2 years, respectively, after the rheumatic fever. But in no case had any joint swelling been observed since the rheumatic fever.

Joint pains following rheumatic fever are common enough in persons who have chronic rheumatic fever. But such people have a history of relapses with joint swelling, and frequently an elevated erythrocyte sedimentation rate, and often evidence of organic heart disease. This group of arthralgias without objective signs lacked these characteristics over a period of many years. It seems more likely, therefore, that the history of rheumatic fever is incidental, perhaps providing a suggestion which the psychoneurotic adopts, perhaps altering joint mechanisms in some way capable of causing pain in emotionally unstable persons. But it seems that a history of rheumatic fever, in the absence of relapses with objective findings, should not be taken to indicate an organic basis in the sense of arthritis, for joint pain.

Similar remarks are applicable to other forms of arthritis than rheumatic fever. One of these patients had, in 1932, an arthritis that was probably gonorrhœal. His recurrent arthralgia followed this, but whereas only a knee apparently was affected by his arthritis, the strictly subjective arthralgia involved many joints for 11 years. Another had an arthritis following scarlet fever in 1935 and his arthralgia dated from this illness. Neuralgic pains were associated and he had well marked emotional instability.

Previous joint trauma.—Four of the 26 cases had a past history of trauma to affected joints or to long bones. Three of these are described at length below (cases 2, 3, and 6). Two of the four (cases 2 and 3) dated the arthralgia from the trauma. But the arthralgia in both cases was multiple. It is hard to see any direct connection between the trauma to a single joint and the multiple arthralgia.

Duration of arthralgia.—The duration of recurrent joint pain in this series without objective findings ranged from a few months up to fifteen years. The arthralgia had been persistently recurrent for more than two years in 19 cases, more than five years in 15 cases, more than 10 years in 7 cases.

Severity and degree of disability.—Twelve of the 26 had been treated at some time by rest in bed. Six had had two or more admissions to military hospitals. A good idea of the disability will be obtained from the detailed case histories below.

Physical examination.—All these men were thin or no more than moderately well nourished. Foci of infection were not found any more often than might be expected in any group. No case of organic heart disease was encountered. X-rays were taken in 12 cases, always with negative result. Sedimentation rates were found normal in 18 of the 26. Two cases had a rate of 12 mm. in 1 hour. One a rate of 22, one, a rate of 14.

In five cases, palpable clicking was felt in one or more joints. None of these had any history of joint swelling. I do not feel sure of the significance of this finding.

Joint swelling, peri-articular swelling, nodules, limitation of movement, muscle wasting, sharply localized tenderness, were not found in any of these cases.

Prognosis.—The long duration of many of the cases in this series and the persistent absence of arthritis in any objective sense would seem to show that this group is not especially likely to develop arthritis in spite of their persistently recurrent arthralgia.

DISPOSAL OF 26 CASES OF ARTHRALGIA

None of these cases was admitted to hospital from the clinic, but the R.M.O. returned one case (case 2) for hospital care. Apparently it was found possible to handle all the others without hospitalization for the arthralgia. Two cases reached hospital for treatment for conditions unrelated to arthralgia soon after their visit to the clinic. Eight cases were referred to the psychiatrist for disposal by him. Five were returned to duty without recommending recategorization. Nine cases were returned to unit with advice that category be lowered. One case was boarded to D.P. and N.H. for trouble unrelated to arthralgia. Two cases were recruits and their rejection was advised. One case was "temporarily allocated for limited

duty'' on the basis of mental defect. Physiotherapy was given at the hospital to some of these men, who attended as out-patients. It seemed often quite ineffective in giving relief.

One case had also psoriasis. Some authorities have claimed a relationship between psoriasis and joint trouble.

The histories of the six cases who had two or more admissions to military hospitals follow in considerable detail. They illustrate well the disability, and the difficulty experienced in recognizing and treating these cases.

CASE 1

In 1935 this man was confined to the house, but not to bed, for 6 weeks, with pain and ''slight swelling'' of both knees and both ankles. He says he had slight fever and that the illness began with a cold. In 1936, 1937 and 1939, he had attacks of pain in knees and ankles without swelling, and causing short loss of time from work on each occasion. He enlisted in 1939. In the spring of 1940, following exposure to cold and wet, he was in a military hospital for joint pain without swelling and this led to his discharge from the army in June of 1940. He re-enlisted in August, 1940, and was sent overseas in February, 1941. In May of 1941 he was hospitalized for pain in knees and ankles without swelling, under a diagnosis of ''traumatic synovitis'', but the man gave no history of injury. He was in military hospital again in December, 1941, for pain in knees and ankles without swelling, and on this occasion was given a diagnosis of ''myalgia''. He was returned to Canada on duty, not for illness. After a long march in July, 1942, he had pain in knees and was excused marches from then on. He came to my medical clinic December, 1942, complaining again of pain in knees and ankles and right hand.

In 1936 this man married a graduate nurse. They very soon had serious quarrels. The man was ambitious to become an artist and used this as an excuse for neglecting remunerative work, at the same time refusing to take formal instruction in art. This led to much quarreling with his wife and finally she left him and got a divorce in the U.S.A. while he was overseas. On his return he lived with another woman. After some months, he married her in the U.S.A. Both this divorce and marriage are illegal in Canada and this thought worries him. His hand has been sore at times since 1939. This greatly worries him. He says ''as an artist my right hand is my whole life''.

His father is ''nervous''. Had ''shell-shock'' in the last war.

On examination his manner seemed pleasant and co-operative, quiet and self-possessed, and intelligent. Good colour.

Pupils, mouth, throat, neck, lungs, heart, abdomen, and knee jerks not remarkable. Knees and ankles and all joints show no abnormality, except for the right hand. This hand is held in a position of slight flexion at the metacarpo-phalangeal joints and extremes of flexion and extension at these joints are resisted because of complaint of pain. There is no visible swelling here, however. The nails are bitten short. The grip of the right hand is weaker than that of the left. X-ray of the hand shows no abnormality. Sedimentation rate 4 mm. in 1 hour. Hæmoglobin 68%. Urine negative.

The patient probably had a polyarthritis in 1939. But in spite of repeated and disabling attacks of joint pain he shows no present objective evidence of arthritis. His life for seven years has been in an emotional tangle. I cannot say he does not have joint pain, but I feel this pain, if present, is ''functional'', or at least lacks organic basis in the sense of ''arthritis''. The hand is considered to be an hysterical manifestation,—perhaps his way of explaining his failure to make a successful career as an artist. *Diagnosis.* — Functional nervous disease with arthralgia. He was not hospitalized but was returned to duty. His emotional difficulties are related to civilian rather than army problems and for this reason it was felt he might succeed in army life in Canada.

CASE 2

This man stated he had injured his right knee about the middle of March, 1941. There was no swelling at the time, but he noted some tenderness over right knee cap. This subsided and he remained on duty. About April 16 he noted swelling over the right knee cap and on April 23 was sent to hospital where he was found to have a right prepatellar bursitis. He was treated by aspiration of fluid from the bursa and later by excision. The wound healed normally and he left hospital a month after admission, being given three weeks' sick leave.

A year later he returned, in March, 1942, and with a letter from his commanding officer saying that the man was still complaining of his knee and was frequently on sick parade. The surgeon consultant found that the man could not flex the knee beyond a right angle voluntarily but that the knee could be bent ''a few degrees'' beyond a right angle with pressure. He advised physiotherapy and active movements of the knee and returned him to duty. There were no other objective findings. It was felt that the man's disability was greater than the organic basis of it could explain and his commanding officer was so advised.

Two months later, in May, 1942, the man was admitted to hospital because of pains across the lumbar region, shoulders, and back, across back of head, and into the arms and hands. No complaint of the knee was made at this time. There were no objective findings whatever. He was afebrile. He had an attack of influenza while in hospital, with febrile onset a month after admission. In the absence of objective findings, salicylates were not given till after his febrile episode and no clinical improvement of joint pain occurred. After his influenza salicylates were given and clinical improvement followed. The medical officer noted ''trembling when excited, easy perspiration, cold hands and feet'' and that the man seemed surly and critical of his medical treatment over the past fifteen months. Sedimentation rate before his febrile episode was 1 mm. in 1 hour. The neuropsychiatrist felt his condition was not explicable on the basis of functional nervous disorder. A diagnosis of subacute rheumatic fever was made, but it was noted that this diagnosis was made tentatively and that the man's disability had been out of all proportion to the findings.

On August 13, 1942, he returned to hospital complaining of ''pains all over his body''. There were no objective findings indicative of disease. The sedimentation rate was 6 mm. in 1 hour. A diagnosis of ''multiple neuralgia'' was made. After discharge he was transferred away from the Atlantic coast. On discharge he was still complaining.

Reviewing this case it is seen that this man was under observation for sixteen months, during which his complaints were continuous; and except for his traumatic bursitis at the onset, there were no objective findings. The man was continuously unhappy and surly in his demeanour and showed evidence of some emotional instability, though not enough to convince the psychiatrist. No personal history of cause for functional nervous disorder could be obtained. We did not think he was entirely malingering, though we suspected exaggeration of disability. *Diagnosis.*—Arthralgia and neuralgia. Or, one might add, "What do you suggest?" Some would say fibrositis. I think the man was an unwilling soldier. He used his genuine knee disability for more than it was worth for a whole year, then, when rebuked for this, developed multiple pains without discoverable organic basis.

CASE 3

In 1930 this man fractured his left tibia and fibula. He stated that some weeks after return to work, pain developed at the site of fracture and that there was a discharge of pus and blood for a month, but that he did not seek medical aid for this. Since that time he has frequently had pain in ankles, knees, wrists, and shoulders, and states that the left ankle has frequently been swollen. He was called up for service in March, 1942. In May, 1942, he was treated in a military hospital for seventeen days for pain in joints of arms and legs. The only objective finding was a "nodule over inner aspect of left shin". In August, 1942, he was in hospital for a febrile illness with painful stiff neck, pain across shoulders, malaise and chills and elevated sedimentation rate. In October, 1942, he was again in hospital complaining of pain and swelling of left ankle. No swelling was noted objectively, except "a small diffuse tender mass on posterior surface of left leg about 4 inches above the ankle joint". This had disappeared four days later. His sedimentation rate, five days after admission, was 14 mm. in 1 hour. The neuropsychiatrist noted "probably has difficulty absorbing instruction. Some evidence of emotional instability". The man's mother had been an inmate of a mental hospital for twenty years.

X-ray showed a well healed old fracture of the left tibia and fibula. He returned by request a month later and well marked lymphatic swelling was present about site of old fracture. He said this ankle always became swollen when walked on. A month later still, he came back with a multiple thrombo-phlebitis and was discharged to the Department of Pensions and National Health.

There are several confusing features in this case and there is no easy organic explanation for his recurrent multiple joint pain over a period of 12 years. *Diagnosis.*—Arthralgia with emotional instability and borderline intelligence. Old fracture with recurrent lymphatic swelling. Multiple thrombo-phlebitis.

CASE 4

This man began to have multiple joint pains five or six years ago, but never lost time from work on this account in civil life. He was called to service July, 1941. He stated that in July, 1942, his left ankle was swollen and painful and he had two admissions to military hospital for this, and subsequent sick leave, and light duty. His documents show no record that joint swelling was ever observed by anyone other than the man himself. He reported to the O.P.D. Clinic, November 14, 1942, complaining of pain in ankles, knees, and hips. He had done no duty of any consequence for four months.

All joints were normal on examination and his sedimentation rate was 1 mm. in 1 hour. X-ray of the ankles was normal.

He says "I've never felt well in my life. My nerves are bad. I feel sad all the time". Worried about a sick wife. Has headaches, faint feelings, easily excited, frequent vomiting, has choking sensations, gassy indigestion, low back pain, is tired all the time.

No arthritis, past or present. Chronic psychoneurosis with arthralgia. He was not hospitalized.

CASE 5

He said that in 1935 he consulted a physician for pain in his left knee and ankle without swelling. He did not go to bed but remained at home for two weeks. He had no further pain till February, 1942, twenty months after enlistment. He was then excused duty for 10 days for pain in left knee and ankle without swelling. Pain in various joints had been present "ever since". He had had two admissions to military hospitals for this, in July and October, 1942, respectively, and swelling was not noted and the blood sedimentation rate was not elevated. In one of these admissions fifteen teeth were extracted. He reported to the Out-Patient Clinic on October 27, 1942, complaining of pain in many joints. Other illness was denied.

His father was said to be "rheumatic"; his mother "nervous". Other body functions were reported normal except occasional headache, and he stated he had nocturnal enuresis to age 18 and always rose once at night to urinate.

On examination, his expression was anxious. All joints moved to their full range. A clicking sound could be produced in rapid movements of both shoulders and the left wrist. The man reproduced these noises proudly as evidence of disease. Prostate, normal. X-rays of left shoulder, wrist, and knee were normal. Sedimentation rate 4 mm. in 1 hour. Eagle reaction negative. White blood cells 11,950 with normal differential count. Blood calcium 11.3 mgm. %. He was unimproved by physiotherapy as an outpatient over a period of three weeks.

He was then referred to a neuropsychiatrist who considered him a "mild chronic psychoneurotic" but without more recorded evidence than is detailed above.

Can the clicking noises in his joints be disregarded as evidence of arthritis? We feel they can. *Diagnosis.*—Chronic psychoneurosis with arthralgia; possibly, a malingerer.

CASE 6

In 1934, after a wetting, this man was in bed for one month with "pain and swelling in ankles, knees and one wrist". Ever since then he has had pain at intervals in various joints, especially in wet weather. In April, 1941, shortly before enlistment, he had a fall and, though no bones were broken, the

right knee was treated in a plaster splint and the latter was removed only a day or two before enlistment. He enlisted in July, 1941, and since then has had seven admissions to hospitals. Three of these were for mild upper respiratory infections. One for "synovitis", right knee; and three for "chronic fibrositis". There is no mention of joint swelling in any of his hospital records.

He reported to the O.P.D. clinic in October, 1942, having done no military duty in the previous six months. He complained of pain in the arches of feet, knees, ankles, back of calves, "all through" his thighs, back of both shoulders, and short sharp left supramammary pain. He said that the pain in his knees and ankles and feet "never goes away". But he found it hard to describe this pain. Apparently most of the time there was no pain anywhere but a "feeling of tightness" and, on movement, "a shooting sensation that goes up and down my legs". This sensation is the same sort of thing as he feels in the left supramammary region. However, on wet days "joints really do ache". The man says the right knee and both feet were swollen in July, 1942, but the records do not mention this. In one of his hospitalizations cystoscopy and pyelography had been done, because the man claimed to have passed blood. The findings were normal.

He threw up a chance to study medicine to get married. Then his wife left him. He quit a good job to enlist "to get away from it all"; he contemplates desertion from the Army now, and has suicidal thoughts. Complains of frequent throbbing in temples, faint feelings, rare syncope, is easily and frequently excited with trembling, easily depressed, with weeping once or twice a month, undue dyspnœa, palpitation, frequent vomiting, hesitancy of urination, feels very nervous, "like screaming". It should be noted that the man does not parade these nervous symptoms. They must be asked for directly. He is keen only on convincing the examiner that he has joint pain.

On examination his manner was quiet, with an apparent effort at restraint; his movements were awkward in kicking my outstretched hand when asked to do so, looks sad, nails bitten, occasional sigh, knee jerks accented. All joints seem normal. X-ray of lumbar, thoracic and cervical spine normal. X-ray of right knee normal. White blood cells 8,750. His sedimentation rate was 1 mm. in 1 hour.

Chronic psychoneurosis with arthralgia and neuralgia. Because he has a real cause for unhappiness, careful handling seems to offer some prospect of improvement, but probably not in the army. He was not hospitalized.

DISCUSSION

Here, then, are twenty-six cases of recurrent joint pain, most of them of long duration, and no objective findings to explain the pain.

I think we must admit the existence of the pain. It is certainly quite useless to deny it. But it is quite wrong to call the pain an arthritis or rheumatic fever, as is often done.

Fibrositis is a term which is often used to describe these cases. "Myositis" is sometimes used as a synonym, but is probably a misnomer, as the pathological findings are said to be limited to the fibrous tissue. We can accept the term "fibrositis" as defining the lesion in such conditions as lumbago and wry neck. It may be also that a fibrositis of periarticular fibrous tissue explains those cases of joint pain in which accurately located tenderness can be demonstrated, especially if tender thickenings are present. The latter seem to me to be rare. There are certainly degrees of fibrositis and this diagnosis *may* also be applicable to cases of joint pain without objective findings, but such an unsupported diagnosis must always be an unwarranted assumption in the absence of objective findings. My belief is that fibrositis should not be diagnosed in the absence of muscle spasm or of sharply localized tender nodules or thickenings.

Since one must have a term by which joint pain without objective findings may be referred to, I suggest that arthralgia is suitable and to be preferred to all others because it is noncommittal.

There seems to be some relationship between most cases of arthralgia and emotional instability. Two explanations seem possible. First, that some systemic disorder causes both arthralgia and emotional instability. Secondly, that slight joint pain due to minor degrees of fibrositis are so common as to occur in almost everybody, but the emotionally unstable person elevates minor intermittent discomfort to the status of a disability.

Let me emphasize that systemic disorders *can* cause joint pain without objective evidence of joint disease. Examples are rheumatic fever or gout in remission, allergic reactions, sulfonamide therapy, influenza, hyperparathyroidism, sub-acute combined sclerosis. In addition there are joint pains due to recognizable local diseases but not to fibrositis or arthritis. For example, old fractures, scalenus anticus syndrome (affecting the shoulders); referred pain from visceral disease (affecting the shoulders); referred pain in knee from disease of hip, various bone diseases, bursitis, sprains, strains, and dislocations, synovitis or hydrarthrosis.

These lists are certainly incomplete but are long enough to warn against the assumption that every joint pain is either arthritis or fibrositis.

Synovitis, I think, cannot be diagnosed in the absence of objective findings. It requires the finding of effusion into the joint or of a fine crepitus distinct from the common joint clicking which is not to be interpreted as causing disability. It is purely a traumatic disorder. Joint effusions with non-traumatic causes are usually termed hydrarthrosis.

"Fibrositis" is apt to be the physician's escape from reality. This diagnosis should not be made unless involuntary muscle spasm can be demonstrated or definite tender points or definite tender nodules or thickenings can be felt, and this will be rarely. If you stick to this rule you may be embarrassed for want of a diagnosis sometimes, but that is better than putting on a false label.

SUMMARY AND CONCLUSIONS

A survey is presented of 26 cases of joint pain having no objective findings indicative of disease.

In the great majority of these cases well marked emotional instability was noted.

The long duration of symptoms without objective evidence of arthritis suggests that this joint pain is not a precursor or "*forme fruste*" of arthritis but something different in kind.

The term "arthralgia" is, therefore, a justifiable designation of these cases. In the present state of our knowledge we often cannot and should not be more precise than this.

There are many causes of arthralgia, some of which are mentioned. The cause should be identified when possible, but this is often impossible.

The evidence here presented suggests that emotional instability is frequently associated with arthralgia. The mechanism of this relationship is not known. The emotional instability is often the greater disability, though not usually the chief complaint.

The term "fibrositis" is best avoided if not supported by positive findings.

"Arthritis" and "rheumatic fever" should never be diagnosed without objective evidence perceived by the medical officer himself, or his trained assistants.

In most cases the category of these cases must be lowered, but hospital care is not usually needed and, when apparently needed, is not very helpful.

RÉSUMÉ

Vingt-six cas de douleurs articulaires de relativement longue durée sont étudiés. Chez les 26 on ne trouva aucune symptômatologie objective; mais chez tous on a noté un degré considérable d'instabilité émotive.

Le mot "arthralgie", qui n'est pas idéal, répond mieux à la description de ces cas que ceux de fibrosite, de myosite ou de séquelles rhumatismales qui ont une étiologie et une évolution différentes. De tels malades ne gagnent pas à être hospitalisés; peut-être peuvent-ils être classés dans une catégorie inférieure, car cet état crée chez eux un handicap indéniable. JEAN SAUCIER

INVESTIGATION OF PNEUMOTHORAX AND RESPIRATORY FUNCTION AT ALTITUDE*

By Captain Eric W. Peterson, R.C.A.M.C., Flight-Lieut. Basil S. Kent, R.A.F.V.R., Howard R. Ripley, M.D. and Captain David R. Murphy, R.C.A.M.C.

VARIOUS authors have presented proof that a pneumothorax expands at altitude in accord with Boyle's law. The effects which this expansion may have on respiratory functions inside the chest are of importance in the case of transport of casualties by air. It was intended in this present study to investigate the behaviour of human subjects with pneumothorax under these circumstances by means of x-rays of the chest and simultaneous estimations of the arterial blood oxygen saturation with a view to finding out accurately what degree of embarrassment to respiration could then occur, and to note other secondary effects of disturbed intrathoracic pressure relations.

METHOD OF INVESTIGATION

1. A portable x-ray machine was brought into the chamber. The patients were seated on a small stool forty inches from the tube. They held a standard chest cassette in front of their chests with both arms, and exposures were taken in the postero-anterior position. (Factors employed; 15 MA, ¼ sec., 80 k.v.). Pictures were made at ground level and at 5,000-feet intervals. Arrangement of x-ray tube and patient is shown in Fig. 1.

2. A Millikan oximeter was affixed to the patient's ear in the proper manner after first producing maximal vasodilatation and calibrating ear thickness. This provided a constant photoelectric estimation of the arterial blood oxygen saturation throughout the experiment.

3. Pulse and respiratory rates were taken at each 5,000-feet interval and recorded.

4. The patients received excess oxygen from ground level. They were fitted with standard B-L-B masks. The blood oxygen was assumed to be 100% at ground level. As they were both adapted ambulatory cases, any reduction in the blood oxygen saturation at altitude

* Investigations carried out for the Associate Committee on Army Medical Research, National Research Council, Ottawa, and the Research Division, D.G.M.S., National Defense Headquarters, Ottawa.

could only be due to mechanical factors in the chest, and not due to a lack of oxygen being furnished to the patients.

5. Ascent in a decompression chamber was made at the rate of 1,000 feet per minute, and plateau levels arranged at 5,000-feet intervals to enable x-rays to be taken and other data to be recorded.

RESULTS

CASE 1

A 56-year old male subject with 20% pneumothorax on the right side. (This patient had had tuberculosis since 1937 and right pneumothorax since April, 1942).

Altitude in feet	*Pulse rate*	*Respiratory rate*	*Oximeter % O_2*	*Collapse %*	*Remarks*
Ground level..	100	18	100	20	
5,000...	108	18	99	20 - 25	
10,000...	108	18	99	35	
15,000...	108	20	98	70	
20,000...	112	20	97	75 - 80	At 18,000 feet patients felt a "little full".

This patient complained of no untoward symptoms apart from a feeling of fullness in the right chest at 20,000 feet. He was calm and did not show any dyspnœa at altitude. His apex beat was not easily palpable and no shift of the heart could be discovered clinically during the decompression. During the descent his mask was removed at 10,000 feet and it was noted that at this level he experienced no respiratory distress. It will be noted in the accompanying tracings from the x-ray photographs (Fig. 2) that mediastinal shift in this patient was negligible.

CASE 2

A 21 year old male adult with 50% pneumothorax on the right side. (This patient had had tuberculosis since 1941 and a right pneumothorax since August, 1942).

Altitude in feet	*Pulse rate*	*Respiratory rate*	*Oximeter % O_2*	*Collapse %*	*Remarks*
Ground level..	116	24	100	50	Nervous
5,000...	140	30	100	65	
10,000...	152	32	98 - 99	75 - 80	Slightly tight in chest.
15,000...	168	36	90	90	*

*Very uncomfortable—marked coughing and tight in chest.

This patient exhibited less composure than did the first case. He was obviously somewhat nervous before the run began, but showed a definite tendency to gain confidence as time went by. It will be noted that even at ground level his pulse and respiratory rates were accelerated. The patient was not allowed to ascend above 15,000 feet because of the amount of respiratory embarrassment exhibited. Also at this altitude he had a frequent dry irritative cough, and felt very tight in his right chest. The patient was compressed at the rate of 2,000 feet per minute and the symptoms rapidly disappeared. Mediastinal shift in this case was more pronounced (Fig. 3) than in the first one and apparently contributed to his symptoms.

DISCUSSION

The expansion at altitude of each of these pneumothorax cases is dramatically shown in the accompanying tracings and listed results. This is entirely in accord with well established facts. The difference between the two cases is worth emphasizing. In the first place, the smaller pneumothorax, which showed little tendency for the mediastinum to shift, was able to attain a significantly greater altitude, *viz.*, 20,000 feet, before the subject experienced the sensation of fullness in the chest. Also this patient gave less evidence of loss of respiratory reserve, in that he was still able to oxygenate his blood almost to the full extent even at 20,000 feet and at 10,000 feet without oxygen.

The second case not only had distress at a lower altitude, but also a significant reduction in respiratory reserve, according to the blood oxygen values. The objective basis for this finding is well seen in the tracings from the x-ray photographs. Not only is the homolateral lung completely collapsed, but the mediastinal structures have moved towards the contralateral hemithorax. The tracheal and bronchial shadows were obviously displaced as well as the heart. It seems probable that displacement and kinking of the large air passages was responsible for the dry irritative cough which occurred in this subject.

The cases presented show that, in so far as the mechanical factors of lung expansion influence blood oxygenation, a marked quantitative difference exists between the ability of a smaller vs. a larger pneumothorax to withstand altitude, even under circumstances in which the reduced oxygen tension of altitude has been fully compensated; the larger the pneumothorax, the more pronounced the mediastinal shift. On the other hand, a moderate pneumothorax can easily bring about a significant reduction of pulmonary reserve, even when excess oxygen is given and considerable distress can be caused to the patient.

Thus far the discussion has been restricted to pneumothoraces whose gaseous volume is al-

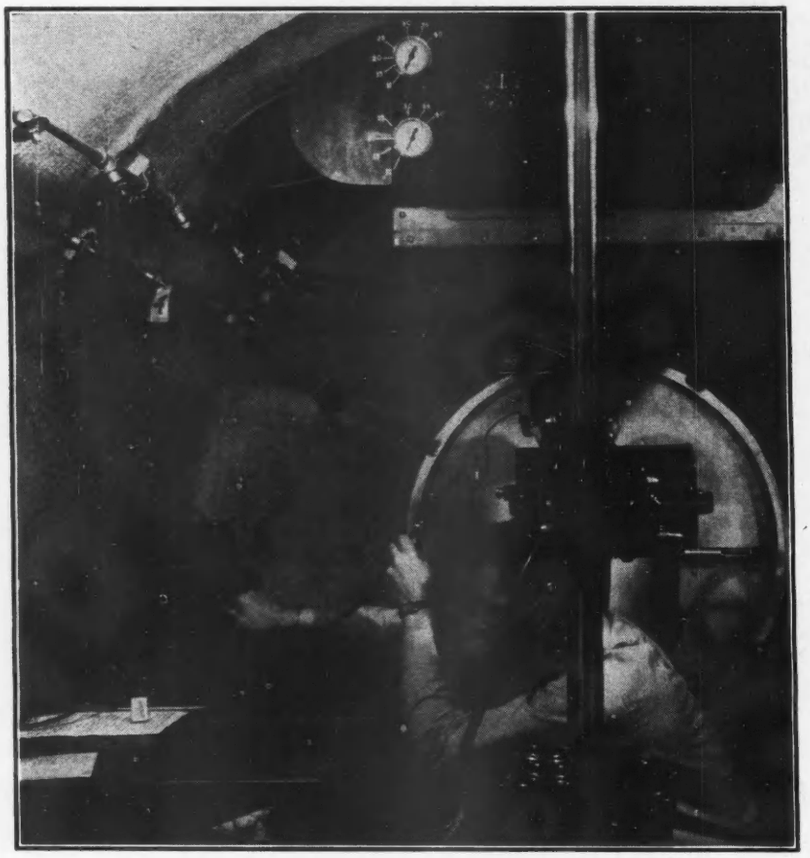

Fig. 1.—Showing the arrangement inside the chamber for taking x-rays of the chest at altitude, and also for measuring blood oxygen saturation.

ready limited. A so-called tension pneumothorax, due to broncho-pleural fistula, has an additional reason for enlarging at altitude besides simple expansion. There is the further factor of continued leakage into the pleural space. Such leakage would of necessity require continued aspiration of the pleural cavity and this would also eliminate the effects which would ensue from any expansion of a pneumothorax at altitude.

Cases exhibiting sucking wounds of the chest would not be candidates for air evacuation until they had received routine first-aid treatment including the prevention of further air suction into the thorax. Such cases are thus transformed into the same functional category as a simple pneumothorax. Therefore, they will behave at altitude in a manner related to their original size.

Prior to the evacuation of pneumothorax casualties, it is of primary importance to ascertain its approximate size. In cases of large pneumothorax, aspiration should be effected before take-off. Altitude is of secondary importance, although it might in certain cases necessitate aspiration during flight. Tension pneumothoraces should have a tube inserted and retained in the chest to allow for continued aspiration if necessary.

The distress due to cough calls for the giving of an effective cough sedative.

Since many cases of pneumothorax will be suffering also from the effects of hæmorrhage and shock, oxygen should be given from the ground level wherever possible. Even so, this does not mean that when oxygen is not available cases of small pneumothorax should be deprived of air transport, provided the altitude is not excessive.

SUMMARY

1. Two cases of pneumothorax which were subjected to conditions of altitude while breathing oxygen are described. X-ray pictures were taken at ground level and 5,000-feet intervals. Arterial blood oxygen estimations were made with the Millikan oximeter.

2. A small pneumothorax (20% collapse) was noted to experience no significant decrease in

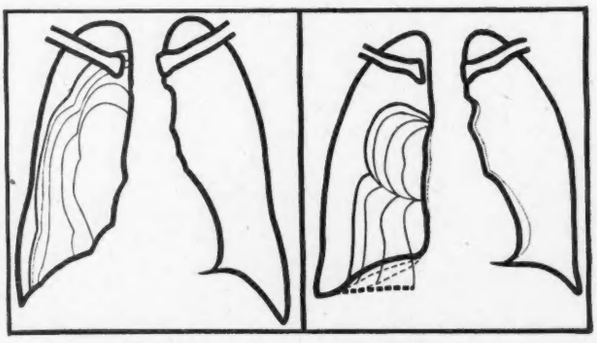

Fig. 2. Fig. 3.

Fig. 2. Case 1.—Tracings made from chest plates, greatly reduced in size. On the right side the outline of the lung at various altitudes is illustrated. The concentric tracings show the degree of collapse at various altitude levels: ground, 20%; 5,000 feet, 20 to 25%; 10,000 feet, 35%; 15,000 feet, 70%; 20,000 feet, 75 to 80%.

Fig. 3. Case 2.—Tracings made from chest plates, greatly reduced in size. On the right side the outline of the lung at various altitudes is shown. The concentric tracings show the degree of collapse at various altitude levels: ground, 50%; 5,000 feet, 65%; 10,000 feet, 75 to 80%; 15,000 feet, 90%.

In addition, it is noted that a progressive depression of the right leaf of the diaphragm occurred as well as some degree of mediastinal shift. These are indicated by dotted lines.

respiratory reserve even when decompressed to 20,000 feet.

3. A large pneumothorax (50% collapse) experienced definite reduction in the respiratory reserve and marked symptoms at 15,000 feet.

4. It is recommended that: (*a*) assessment of pneumothorax size must be made; (*b*) that large pneumothoraces must be reduced prior to ascent; (*c*) flying altitude must be considered; (*d*) cough must be allayed where present; (*e*) oxygen should be given from ground level where possible.

INTESTINAL GAS VOLUMES AT ALTITUDE*

By Captain Eric W. Peterson, R.C.A.M.C., Flight-Lieut. Basil S. Kent, R.A.F.V.R. and Howard R. Ripley, M.D.

THE transportation of casualties by air brings up the question of expansion of intestinal gases at altitude. This is especially of interest in the case of patients who are abdominal casualties or who are suffering from intestinal ileus or distension. The secondary results of distension or of the escape of gases from perforated bowel could possibly be harmful if an altitude were reached where the gaseous expansion was of any considerable degree.

The physical behaviour of gas under the influence of reduced pressure at altitude follows the law of Boyle. Practical evidence of this behaviour has been frequently brought to the attention of persons accustomed to altitude flying or to working in decompression chambers. It is often their experience to note abdominal distension with concomitant discomfort, both of which are relieved by belching or the passage of flatus. In addition there have been reports of subjects who have been given air by stomach tube, and who have been x-rayed at ground level, and found subsequently to have an increase in the size of the gas bubble in films taken at altitude.

Moreover, it has been shown that the behaviour of gas inside the body does not entirely follow the rules of gas expansion outside the body. This happens because, in the former case, the pressure of the water vapour, which is constantly being given off by the body tissues to any gas mixture within its cavities, remains constant at 47 mm. Hg. and thus acts as an additive factor to the expanding gas so that the actual volume change is greater. This apparent incompatibility with Boyle's law is in accord with its basic principles and is due solely to the fact that the body gases are always being saturated with water vapour (Fig. 1).

The current literature contains little in the way of quantitative check on the expansion of gases in body cavities. Also there has been the assumption that the abdominal wall, the diaphragm and the pelvic floor offer so little resistance to the expansion of gas-filled viscera at altitude that they may be disregarded.

The present investigation has been undertaken to check these facts and to apply quantitative methods to measure the possible resistance of the abdominal parietes to the swelling of gas-filled organs with ascent to altitude.

METHOD OF INVESTIGATION

Experience in aerial flight and ascents in decompression chambers convince one of the expansion of the abdomen at altitude. That this is due to intestinal gas can be ascertained by the prompt relief which is gained by the passage of flatus or by belching. This not only eliminates abdominal distension but also the discomfort.

We have sought to demonstrate radiographically the expansion of gas entrapped in intra-abdominal structures. A human subject was decompressed to 30,000 feet in a decompression chamber after the introduction into the stomach of 400 c.c. of air from a Bethune pneumothorax apparatus through a stomach tube. The tube was immediately withdrawn, and ascent was rapidly carried out lest air be lost by eructations. X-ray pictures were taken of the subject in the sitting position by means of a portable x-ray machine inside the chamber. Exposures were made at ground level and every 5,000 feet up to 30,000 feet. On reaching this altitude the subject experienced fullness in the stomach and had a strong desire to belch, and this gave prompt relief. At no time was the distension of an amount likely to hinder respiration. Results are shown in Fig. 2.

Further x-ray studies of this kind were carried out on cats. Animals were prepared by inserting into the peritoneum high grade rubber

* Investigations carried out for the Associate Committee on Army Medical Research, National Research Council, Ottawa, and the Research Division, D.G.M.S., National Defense Headquarters, Ottawa.

condoms which had been treated with a thin coating of rubber cement, impregnated with barium and turned inside-out. These bladders were easily distensible and contained 50 c.c. of air. The animals were decompressed under a bell jar, and x-ray pictures were made through the glass at altitude of zero, 10,000, 15,000 and 20,000 feet. During decompression the abdomens were noted to swell. In order to keep the animals quiet they were lightly anæsthetized with nembutal. These experiments illustrated clearly that the bladders distended markedly with increased altitude.

The distensibility of the bladders employed was tested quantitatively. One bladder was placed in a graduated cylinder and held under the surface of the water by means of a weight. The bladder contained 90 c.c. of air. The level of the fluid at ground level was 400 c.c., at 30,000 feet it had increased to 600 c.c. This change is 3.22 times the original volume. This is slightly less than the calculated volume change for gas at this altitude. This means that the resistance to expansion offered by the bladder is insignificant.

An experiment was performed on a lightly anæsthetized cat to investigate manometrically whether there was any resistance opposing the expansion of gas-filled abdominal structures by the abdominal walls, and the pelvic and thoracic diaphragms. A bladder was prepared on the hub of a number 15 gauge needle to which a

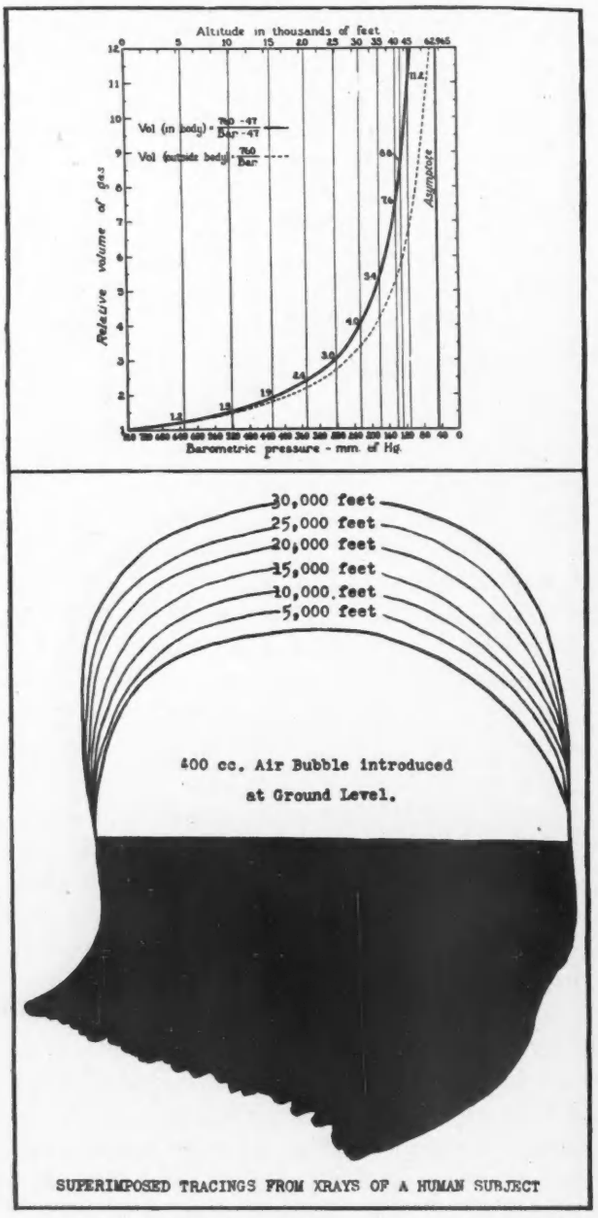

Fig. 1.—Comparative volumes of gas (saturated at 37° C.; the pressure of aqueous vapour at this temperature is 47 mm. of mercury) inside and outside the body at various altitudes.
(From Lovelace and Hinshaw: *War Medicine*, 1942, 2: 580.)

Fig. 2.—Behaviour of gas bubble in human stomach at various altitudes.

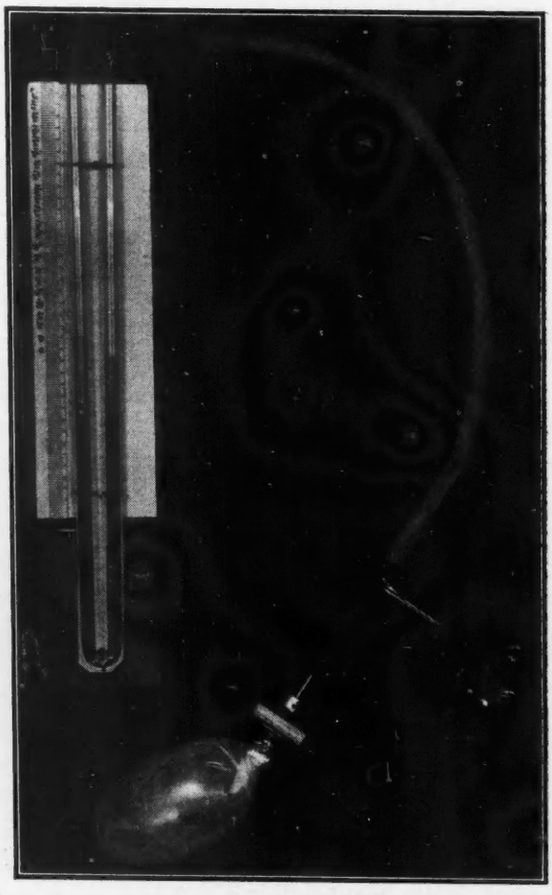

Fig. 3.—The apparatus for abdominal manometry. The balloon inflated and connected with a mercury manometer. A small block of wood is inserted between the flanges in the position which would be occupied by the anterior abdominal wall. The side connection with the clamp was used for filling the balloon with air by means of a syringe.

flange had been affixed. The abdomen was opened, and the needle thrust through the abdominal wall so that the flange rested against the peritoneum, and the bladder was inside the abdomen. The abdominal incision which was very short was then closed. Another flange was placed over the end of the needle so as to sandwich the abdominal wall between it and its fellow and thus hold the needle in place. A small brass collar and set screw held the outer flange firmly (Fig. 3).

When the animal was decompressed it was prepared by the injection of 100 c.c. of air into the bladder by means of the side connection. A control apparatus was similarly prepared with a manometer and decompressed at the same time. On introducing air into the bladder a small positive pressure was developed in the system, as indicated by the level of mercury in Fig. 3.

The results are shown of both slow (Fig. 4) and rapid (Fig. 5) decompression of this animal while it received oxygen. The equal rise in pressure registered in both manometers is therefore attributable to the resistance of the bladders. Pressing on the animal's abdomen with the hand would raise the mercury level in the manometer, indicating complete patency of the system. The absence of pressure rise at altitude demonstrates that the air in the bladder, which was originally at approximately normal barometric pressure, must have adjusted to the reduced pressure at altitude. This could only happen if the entrapped gas volume enlarged in a manner corresponding to the rarefaction of the air in the chamber, and with a corresponding reduction in pressure.

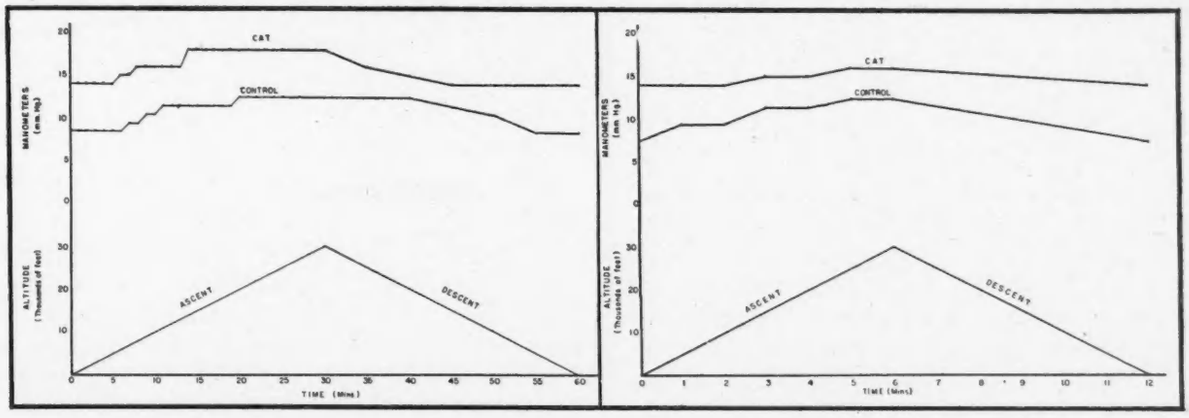

Fig. 4

Fig. 5

DISCUSSION

The investigations just outlined illustrate the fact that the gas-filled abdominal viscera expand at altitude. Up to 10,000 feet, as shown in the graph (Fig. 1) this expansion is not very great; *viz.*, only 1.5 times the original volume. This expansion follows the principle of Boyle's law, and is not resisted to any extent by the abdominal parietes.

The importance of these findings in the field of air evacuation is variable. First, if the amount of gas present in the abdomen is small and if the altitude is not great, then little effect from reduced barometric pressure can be expected. Secondly, if marked distension is present, even at ground level, and altitude is moderately great, then the effects on body mechanics will be much more marked. Respiratory distress will prove to be an important complication due to interference with diaphragmatic excursion, in addition to the more local effects; *viz.*, abdominal distress. The effects of pressure and impaired respiratory function will further hinder venous return. Thirdly, when the bowel has been perforated, escaping gas might cause significantly increased soiling of the peritoneum so as to be classed as a detrimental complicating factor, in so far as air transport is concerned. However, in this regard it must be remembered that minimal altitudes which will afford smooth air for transport, will, in most instances, also afford a sufficient margin of safety by being less than the altitudes at which gaseous expansion becomes marked. Also some soiling from this source during transport must not be considered without comparing it with the soiling that may have already occurred while wounded are being collected from the battle field, or which would occur during the jostling over rough terrain in an ambulance with even greater delay before definitive surgical treatment.

Routine precautions can meet the problem of abdominal gas prophylactically; *viz.*, stomach

and rectal tubes inserted, and enemas given, before flight, to those wounded in whom they are indicated, also the avoidance of high altitude and too rapid ascent where possible.

SUMMARY AND CONCLUSIONS

1. It is easy to observe that the abdomen swells at altitude due to the expansion of intestinal gas. The swelling is relieved by belching and the passage of flatus.

2. The expansion of intestinal gas is not interfered with by the resistance of the abdominal parietes. This is illustrated qualitatively by the observed expansion of both gas in the stomach and in the bowel lumen and in bladders of an easily distensible variety, rendered radio-opaque and placed in the peritoneal cavity.

3. The distensibility of bladders was quantitatively tested by showing that they expanded in a quantitative manner at altitudes due to the gaseous contents, in accord with Boyle's law.

4. Manometric investigation of gas contained in a bladder in the peritoneum showed no rise in gas pressure at altitude, indicating that free expansion of the entrapped gas was not interfered with by the muscular structures surrounding the abdomen.

5. In air transport of wounded, intestinal gas will expand at altitude. The significance of this expansion on the patient from the point of view of peritoneal soiling remains to be investigated. At present its seriousness at reasonable altitudes is conjectural.

6. Routine precautions (enemas, rectal and stomach tubes) should be taken in all cases where indicated, particularly if the flight is to be at a high altitude.

HALITOSIS.—Dr. A. D. McDwyer (Dublin) writes: In the answer to the query on halitosis (January 29, p. 172) no reference was made to the excellent annotation in the Journal (1942, **1**: 530) on the experimental work of Crohn and Drosd. Briefly, odoriferous substances are mainly absorbed in the small intestine and stored in the liver, from which they go into general circulation for 48 hours. In unexplained halitosis a low-fat diet (40 to 60 gm.) gives relief. It is thought that certain offensive volatile products of fat digestion pass to the liver and from there are slowly given off in general circulation. May I also add that either dental sticks or floss provide the best method of removing food particles retained between the teeth where both a toothbrush and mouth washes fail. An early atrophic pharyngitis is a common unrecognized cause and can be reduced to a minimum and prevented by a well-ventilated bedroom during sleep.—*Brit. M. J.*, 1944, **1**: 348.

DIVERTICULA OF THE STOMACH

By Douglas Telford, B.A., M.D.

Vancouver

DIVERTICULA of the stomach are medical curiosities. They are, in addition, important both pathologically and clinically. In possessing a tendency to resemble and be mistaken for many other gastro-intestinal lesions, they enter frequently into a differential diagnosis.

INCIDENCE

The incidence of gastric diverticula is difficult to determine. Roentgenological examination of stomachs suggests a figure of less than 1/10 of 1%. Rivers, Stevens and Kirklin,[1] in a series of 91,532 cases examined radiologically, report an incidence as low as 0.02%, whereas Larimore and Graham,[2] in a series of 3,446 cases, report an incidence of 0.09%.

The incidence of diverticula of the stomach in relation to those of the rest of the alimentary canal is better known. Fraser, quoting from Larimore and Graham,[3] suggests the following order, arranged in decreasing frequency: colon, rectum, duodenum, pharynx, œsophagus, stomach and jejuno-ileum.

AGE AND SEX

The majority of diverticula fail to give symptoms until the fourth or fifth decade. In a report of 14 cases Rivers, Stevens and Kirklin[4] gave the youngest to be 36 and the oldest 71 years of age. Most authors report a slightly greater incidence in females than in males. Martin[6] analyzed 103 cases and found 54 were in women.

CLASSIFICATION

Diverticula of the stomach may be classified as congenital, acquired, and false. Congenital, or true, diverticula occur as blind tubes formed by all coats of the gastric wall. In these there is no evidence that organic disease is a causative factor in their formation. This true variety is found not uncommonly in the human embryo and according to Hillemand *et al.*[7] is similar to those diverticula found frequently in the stomachs of hogs and monkeys. Strangely enough, this congenital variety often includes pancreatic tissue in its tip. Martin[6] has collected 15 such cases.

Acquired diverticula differ from the above in that, although all coats are present they are thinned out or broken in one or more layers. There is usually evidence that the pouching is due to organic disease. A rare pulsion type due to a localized intra-gastric pressure and a more frequently occurring traction type due to a localized extragastric factor are described. Perigastric adhesions to adjacent diseased organs account for the majority of the latter.

False diverticula are outpouchings in which there is a break in the stomach wall due to ulcer or new growth. This type will not be discussed in this paper.

LOCATION

The location of gastric diverticula, particularly the congenital type, is most commonly the posterior wall of the cardia close to both œsophagus and lesser curvature. Reich[5] in a series of 8 cases found all in this situation. Martin[6] in a series of 103 cases reports 63 in this location. Eusterman and Balfour[8] in a series of 14 cases found 6 in this position, 2 in the mid- and 6 in the pre-pyloric portion of the stomach.

SIZE

The size of these stomach outpouchings varies considerably. Their average length is 3 cm., although one was reported by Eusterman and Balfour[8] to be 7.5 cm. in length. Their width at the fundus varies from 1.0 to 5.0 cm. Their neck is, as a rule, considerably narrowed.

PHYSIOLOGY

The physiological activity of the mucosa lining these sacs is undoubtedly similar to that of the adjacent stomach mucosa. The presence, however, occasionally, of pancreatic tissue must modify the secretion. Emptying, especially in the narrow neck variety, is impaired. Evidence of this is afforded by roentgenological examination which has shown barium half filling a diverticulum 5 days after the ingestion of the barium.

PATHOLOGY

Pathological changes occurring are commonly erosions of the mucosa causing sometimes massive hæmorrhage, inflammation of the submucosa and muscle layers causing scarring and thickening, or inflammation of the peritoneum causing adhesions to and disease in adjacent organs or tissues. Tumours, however, may occur, such as adenomyoma, carcinoma, or sarcoma. It is important to note that, to my knowledge, no cases of acute diverticulitis, gangrene, perforation, or localized abscess have been reported.

SYMPTOMS

The majority of gastric diverticula are symptomless. The Mayo Clinic[8] in a review of 14 proved cases suggested that 64% were symptomless. The minority, however, give symptoms varying from vague gastro-intestinal discomfort to the more dramatic acute gastric upsets. Pain, most frequently in the epigastrium, is aching or burning in character but may be stabbing and radiating. Food has no constant relation to the pain and may relieve or aggravate it. High-residue foods are the chief offenders. Belching of gas or bloating are often noted, but nausea and vomiting may occur. Bleeding is not a rare symptom and may be evidenced by hæmatemesis, melæna or secondary anæmia. Epigastric tenderness may be mild or moderate.

Adjacent organs affected either primarily or secondarily to the diverticulum may confuse an otherwise clear clinical picture. The diaphragm may refer pain to the top of the shoulder. The pancreas may refer pain through to the back, while the gall bladder, by adding its signs and symptoms, may obliterate entirely the more subtle picture of a gastric diverticulum.

DIAGNOSIS

There are no characteristic symptoms or signs of gastric diverticula. Therefore the clinician unaided is unlikely to make the diagnosis. The radiologist, however, if he is fortunate enough to demonstrate a well defined sac, provides the missing clue. Radiologists, nevertheless, find many diverticula difficult to demonstrate and often evidence of their presence is misinterpreted. The Mayo Clinic[8] reports a series of six cases diagnosed roentgenologically as diverticulum, in which in only two of the six cases was the diagnosis confirmed at operation. Furthermore, the same report states that only two cases found at operation were diagnosed preoperatively by x-ray.

The gastroscopist visualizes the occasional diverticulum. Schindler[9] observed 3 congenital diverticula in 1,000 gastroscopic examinations.

Special difficulty is encountered in differentiating diverticula from penetrating gastric

ulcer and diaphragmatic hernia. Still more difficulty is met in deciding if the diverticulum visualized roentgenologically, gastroscopically, or at operation, is the cause of the patient's symptoms.

TREATMENT

The majority of gastric diverticula, being symptomless, need no treatment. Those producing mild symptoms and no complications are probably best treated medically. Others, however, found resistant to a medical regimen, or complicated by a serious pathological change within the diverticulum, or associated with any other gastro-intestinal lesion which in itself demands surgical interference, are best excised.

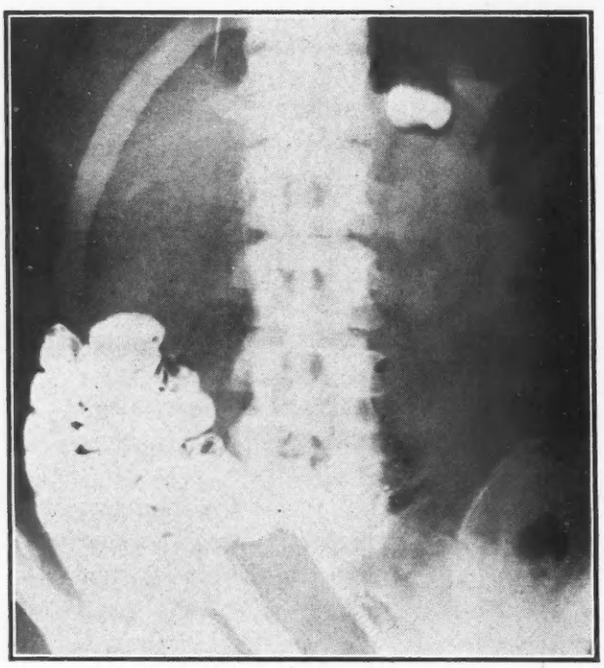

Fig. 1.—Roentgenological examination performed six hours after the ingestion of barium shows the gastric diverticulum partially filled with barium. Mucosal folds are seen running vertically.

CASE REPORT

The patient, a woman, aged 52, consulted the writer in January, 1943. She recited a history of indigestion dating back 25 years. This indigestion was characterized by a feeling of upper abdominal fullness, belching of gas and an epigastric pain nagging and aching in type. Symptoms tended to appear unrelated to meals or time of day. No specific food intolerance was noted except that large meals and those containing residue foods such as lettuce or nuts accentuated the above complaints. The attacks would last several weeks and appear every month or two.

For the previous five years only, the patient suffered a sense of deep discomfort, substernal in position, with even less relation to meals or time of day than her other symptoms.

In the last five months another symptom made its appearance. Pain more constant and penetrating in type occurred in the midline posteriorly in the lower thoracic region. This pain had no relationship to meals and occasionally would awaken the patient out of a deep sleep. Little could be done to gain relief and attacks would often persist unabated for several hours.

Two acute gastric upsets occurred. The first, 19 years ago, appeared without apparent cause. Severe epigastric pain lasted 12 hours and was followed by a soreness which persisted three days. The second attack, 9 years ago, followed two hours after eating nut-cake. Epigastric pain caused the patient to double up and vomiting occurred. The duration of the acute symptoms this time was four hours and the residual soreness 24 hours. In each attack the doctors in attendance made a diagnosis of acute gastritis.

Examination.—The patient was a well nourished female, apparently in good health. Examination of her abdomen revealed nothing remarkable except for an area of midline tenderness high in the epigastrium. There was also a large irregular appendectomy scar. Laboratory findings disclosed a hæmoglobin concentration of 78%, and occult blood of plus 2 concentration was found in the fæces on three successive occasions. Normal acidity was found in the stomach.

X-ray revealed no abnormality on first examination. Nevertheless, six hours after the ingestion of barium, the stomach being empty, a pool of barium was seen to partially fill the sac, the complete outline of which was suggested by streaks of barium along mucosal folds. The sac was attached to the posterior surface of the stomach close to the cardio-œsophageal juncture and was relatively fixed (Fig. 1). Pain was complained of when pressure was exerted at this site. Seventy-two hours after the ingestion of barium the sac was seen to contain approximately half its original barium and, regardless of any change in position of the patient, no barium could be expressed from the sac.

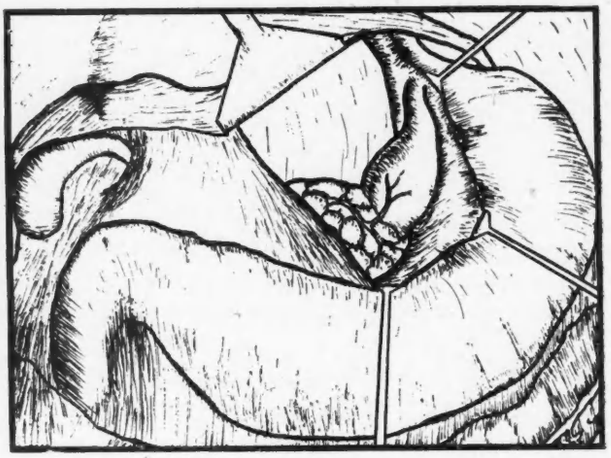

Fig. 2.—The lesser peritoneal sac is shown opened revealing the diverticulum arising from the posterior surface of the stomach. The fundus of the diverticulum is seen partially embedded in and receiving an artery from the pancreas.

OPERATION

The abdomen was opened through a left paramedian incision. General examination of the abdomen was negative, except for a few adhesions at the site of the appendectomy scar. Access to the lesser peritoneal sac was gained by division of the proximal half of the gastrohepatic omentum. By reflection of the liver upwards and by rotation outwards and by traction downwards of the stomach the region of the alleged diverticulum was exposed.

Dissection through numerous adhesions revealed a sac not unlike a gall bladder attached to the posterior surface of the stomach immediately adjacent to both

the cardio-œsophageal juncture and the lesser curvature. The proximal third of the sac was adherent by numerous adhesions to the stomach, the middle third to the pancreas, whereas the distal third was embedded in the pancreas and received a moderately large vessel from that organ (see Fig. 2).

Amputation of the diverticulum was effected by the clamp and cautery method. The stump was oversewn, inverted, and reinforced with omentum. One hundred grains of sulfathiazole in suspension were applied to the area. The gastrohepatic omentum was repaired and the abdomen was closed in layers.

Progress. — Immediate postoperative care included blood transfusion and continuous gastric suction. An uneventful recovery was made and on the fourteenth day after operation the patient was discharged from hospital.

When last examined twelve months following operation, the patient was in good health, having regained her original weight and strength. Her activities included playing golf.

Mild symptoms of indigestion were still experienced following a heavy meal. The persistent pain, however, which appeared five months before operation and which occurred in the midline posteriorly in the lower thoracic region was conspicuous by its absence. No acute gastric episodes had occurred. The hæmoglobin content of the blood was 90% of normal, and repeated examination of the fæces revealed no occult blood.

Pathological report.—Grossly, the diverticulum was seen to measure 8 cm. in length and 3 cm. in width. Its neck was only 1.5 cm. in diameter. The wall of the sac was 3 mm. in thickness and was lined by a mucosa having well developed rugæ similar to those of the stomach. At the base of the sac in the region buried within the pancreas was an area of mucosal erosion.

Microscopically, the appearance was not unlike that of the adjacent stomach except that in places the submucosa and muscular coats were replaced by fibrous tissue.

DISCUSSION

The gastric diverticulum occurring in the author's case was obviously one of the true congenital type. Its position, shape, structure and intimate association with the pancreas all suggest its primary nature.

The indigestion of 25 years' duration was possibly in part due to the disturbed gastric function occasioned by the presence of the diverticulum. The midline low thoracic back pain of five months' duration was probably due to the involvement of the pancreas by inflammation extending from the diverticulum.

The mild anæmia and the occult blood in the stool were probably secondary to the loss of blood from mucosal erosions.

The two attacks of alleged acute gastritis were possibly attacks of acute diverticulitis. No definite proof, unfortunately, can be offered to substantiate this hypothesis. A consideration, however, of the possibility of residue foods becoming trapped in the narrow-necked diverticulum, which was proved radiologically to have a prolonged emptying time, makes this hypothesis a reasonable one.

The advisability of removing such a diverticulum is evidenced by the lack of technical difficulties encountered at operation, by the uneventful postoperative course and, finally, by the almost complete relief of symptoms now enjoyed by the patient, twelve months following diverticulectomy.

SUMMARY

A general discussion of gastric diverticula along with a more detailed report of a case which came under the care of the author has been presented. An attempt has been made to relate the clinical picture of the writer's case to the lesion found at operation. In doing this special consideration has been given to the possibility of there having been three complications: erosion of the mucosa with intermittent bleeding, involvement of the pancreas with persistent dorsal pain, and chronic inflammation of the diverticulum with occasional acute exacerbations.

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PRIMARY CARCINOMA OF THE LIVER COMBINED WITH TUBERCULOSIS AND DIABETES MELLITUS

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PRIMARY carcinoma of the liver is a comparatively rare disease in America and Western Europe. This is in keeping with Virchow's famous dictum, "Such organs as are the frequent sites of secondary tumours rarely exhibit the primary type". Berman,[2] however, reported that it occurs with appalling frequency in most pigmented races. In the case to be reported the patient belongs to the latter group and it is reported primarily because of (1)

association with tuberculosis and diabetes mellitus, and (2) terminal hypoglycæmia.

Although Rokitansky as early as 1849 maintained that a malignant hepatic growth could exist as a primary disorder, the modern literature of primary hepatic carcinoma commences with the publication of two cases by Kelsch and Kiener (1876) and four cases by Sabourin (1881). In 1901 Eggel collected 163 case reports and in 1930 Herxheimer, in an exhaustive survey of the entire European literature, was able to collect only 600 cases. Since that time small series have been added to the literature. Berman, who has probably seen the largest group, reported 270 Bantu cases occurring from 1925 to 1933 in the Witwatersrand Gold Mines and in Johannesburg.

Incidence.—The disease is much more common in males, possibly because of the marked preponderance of cirrhosis in this sex. It is occasionally reported in children, but the majority of cases are usually in the fifth and sixth decades. Racial factors appear to play a prominent part in the disease. It is a common carcinoma amongst all pigmented races, in some of whom it is over forty times more frequent than in Europeans. The autopsy rate for the Bantu is 1.2% and for all the races in Asia, 0.85%. The American negro still exhibits a distinct predisposition towards the disease, as do also emigrated Chinese. Strong and Pitts[27] reported 12 cases in Chinese from Vancouver General Hospital. Conversely, the incidence of this disease among Europeans living in Africa and Asia is as low as it is in the Western countries. Gnassi[15] reported that primary carcinoma of the liver only represents 0.14% of our malignant cases in America.

Association with other diseases.—Cirrhosis has been frequently suggested as a predisposing cause in carcinoma of the liver. Stewart in 124 cases of cirrhosis found primary carcinoma in 7.3%; Counsellor reported association in 3%. In children cirrhosis is rarely present and Steiner[26] reported only 2 cases of cirrhosis in his series of 105 children under sixteen years of age. Portal cirrhosis is by far the most common type in primary carcinoma. If biliary cirrhosis is present it is usually not marked, grossly.

Hæmochromatosis associated with primary carcinoma of the liver has been noted. Several authors stated that the association is no greater than in uncomplicated portal cirrhosis, while others believed that there is an increased incidence, due to the added factor of pigmentation. Sheldon in 363 cases of hæmochromatosis reported an incidence of 7.1% with primary carcinoma of the liver. Stewart in 52 cases reported 11.5%. Berk and Lieber[1] in a smaller series of 15 cases of hæmochromatosis reported 20% associated with primary carcinoma of the liver. Primary carcinoma of the liver, associated with hæmochromatosis and diabetes mellitus, has been reported by Blanton[5] and also by Keith and McNair.[16] It has been well established, however, that an impairment in carbohydrate metabolism is one of the prominent features of hæmochromatosis.

In a series of 10 cases of primary carcinoma of the liver Miller[19] reported three cases with peptic ulcer. This condition is not mentioned in other series and may merely be a coincidence. Charache[8] reported one case of hepatoma associated with miliary tuberculosis.

Metastases.—Primary carcinoma of the liver shows extrahepatic metastases less frequently than does carcinoma elsewhere, but hepatoma very early invades the capillaries, hence metastases within the liver and portal system may be demonstrated in early stages. Thrombosis of the hepatic or portal veins may occur without extensive tumour invasion. Occasionally, the tumour thrombus extends into the vena cava. Extrahepatic metastases occur most frequently in lung, regional lymph glands, and skeletal system. Ewing[12] states that extrahepatic metastases are much earlier and more frequent in cholangioma than with hepatoma.

Classification.—Yamagima classified primary carcinoma of the liver pathologically into (1) benign and malignant hepatoma (liver-cell type) and, (2) benign and malignant cholangioma (bile-duct type). These groups are further subdivided into (*a*) massive single nodular type, usually in the right lobe and present in 23%; (*b*) multiple nodular 64%, and (*c*) diffuse 12%. Ewing described a third or subgroup in which both liver cell and bile duct contributes. Hepatoma is much more common than the biliary type. Ewing stated that malignant cholangioma occurs later in life, rarely before forty years, and more frequently in women. Greene[14] considered that this is due to the higher incidence of biliary disease in females.

Clinical features.—The signs and symptoms of primary carcinoma of the liver are often misleading and the diagnosis of the majority of cases is made at autopsy. Berman has an excellent classification which is based on the symptomatology of the disease. In the first group, "frank" cancer (63% of his series of 270 cases), the signs and symptoms are referred to the liver. The mode of onset is gradual and the symptoms occur in the following order of frequency: abdominal pain, asthenia, dyspnœa associated with enlargement of the liver, tenderness of the liver, loss of weight and emaciation, ascites, jaundice, œdema and dilatation of superficial abdominal veins. Secondary anæmia is a frequent feature of these cases. Berman's other groups are (2) "acute abdominal" cancer (9.1% of his group) in which an acute surgical condition of the abdomen occurred, due to rupture of a carcinomatous nodule or erosion of blood vessels on free margin of liver; (3) "febrile" cancer (7.6%); (4) occult cancer (15.1%), discovered accidentally or at autopsy; (5) "metastatic" cancer (4.6%) in which the metastases overshadowed the primary lesion in the liver.

In the diagnosis of primary carcinoma of the liver laboratory and liver function tests are of little value. Upham and Klotz[28] reported that an increasing alkaline serum phosphatase without other evidence of obstructive disease is suggestive of malignancy in the liver. Schatzki[24] has reported a roentgenological syndrome which he considers to be highly suggestive of primary carcinoma of the liver. It is based on the fact that in the large majority of cases this tumour is associated with cirrhosis of the liver. This may result in the formation of a localized bulge in the diaphragm, usually on the right side. He pointed out that a combination of cirrhosis of liver (œsophageal varices) and a mass in the region of the liver is very suggestive of primary carcinoma of the liver. Ante-mortem diagnosis, however, is usually established by exploratory operation or aspiration biopsy. Peritoneoscopy has also been utilized in obtaining biopsy specimens.

The outlook of this disease is usually hopeless and treatment is palliative. Attempts at radical cure by lobectomy of the liver have been carried out with little success. Most writers are of the opinion that the duration of the disease is short. Periods of from one month to three years have been noted, with most cases averaging only a few months.

CASE REPORT

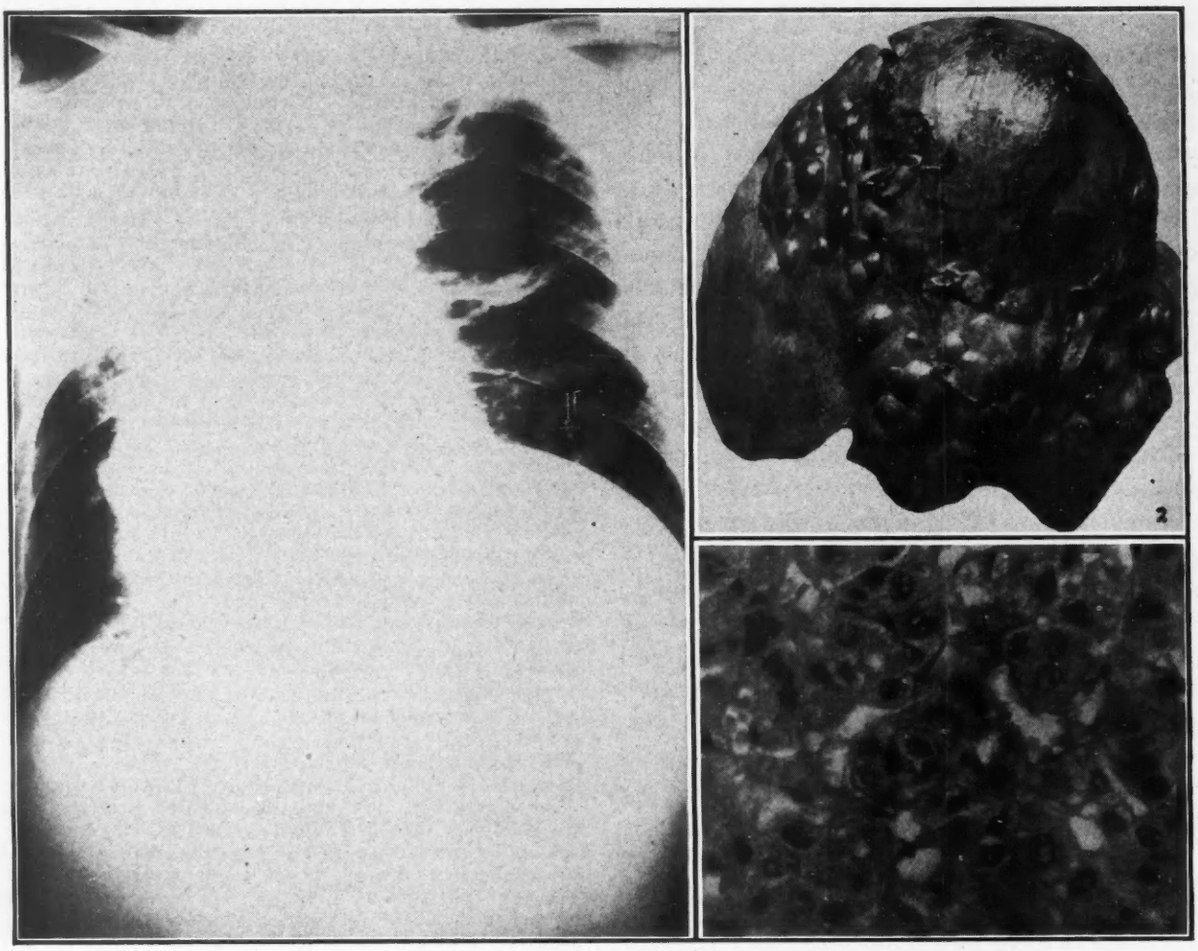
A 56-year old Chinaman was admitted to Queen Alexandra Sanatorium on May 10, 1939, with a history of cough and sputum of two years' duration, blood streaked sputum for 1½ years, fatigue, and loss of weight for one year, pain in the upper left chest and polyuria for six months. The patient was born in China and emigrated to Canada in 1901. There was no history of significant previous illness.

Physical examination.—On admission the patient appeared quite ill, was emaciated and slightly cyanosed. The heart was displaced to the left, but did not appear to be enlarged. Blood pressure was 118/68. The abdomen was essentially negative (liver and spleen were not palpable). Examination of the chest revealed evidence of bilateral disease which was quite extensive on the left. This was confirmed by radiographs. Sputum was positive for tubercle bacilli on direct smear. The sedimentation rate was 86 mm. in one hour (modified Westergren method); hæmoglobin 95% (Dare estimation), red blood cell count 4,920,000; and white blood count, 14,300 per c.mm. The urine revealed a strongly positive Benedict's reaction and the non-fasting blood sugar was 460 mgm. per 100 c.c. of blood. A fractional urinalysis showed a positive Benedict's reaction in all specimens throughout the day and night. Due to poor co-operation by the patient quantitative 24-hour sugar estimations of urine were not carried out, and, unfortunately, a glucose tolerance test was not done.

The patient was immediately started on diabetic routine with a diet of 46 grams protein, 123 grams fat and 50 grams of carbohydrate. Ordinary insulin was given before meals and within a few days it was adjusted to 5, 10 and 5 units daily. Bi-weekly fasting blood sugars were 144, 135, 105 and 113 mgm. per 100 c.c. of blood. The diet was increased to 60 grams protein, 123 grams of fat, 70 grams of carbohydrate, and the subsequent fasting blood sugar estimations were 137, 142, 126, 108 and 149 mgm. After several months the patient became afebrile and showed a slight gain in weight. The diet was gradually increased to 80 grams of protein, 135 grams of fat, 100 grams of carbohydrate, and the patient was stabilized on 15 units of protamine zinc insulin before breakfast. The clinical course was stationary, although urine cultures were found to be positive for tubercle bacilli. In August, 1940, the patient developed slight œdema of the extremities and the liver became palpable just below the costal margin. X-ray of the chest (Fig. 1) showed moderate elevation of the right diaphragm with improvement in the right lung disease. Blood pressure readings were now somewhat elevated, at 160/108. The heart sounds were regular with slight accentuation of the second pulmonary sound. It was felt that the enlarged liver and œdema was due to cardiac failure with associated hypertension.

In October, 1940, the patient complained of dull pain in the right upper quadrant. The physical findings were unchanged, but radiographs revealed a small pleural effusion at the right base. The right diaphragm remained elevated. The patient's condition became retrogressive and a mild jaundice developed with immediate positive direct van den Berg and an indirect of 2.4 units. The urine was positive for bile and urobilin. A barium series on October 9 and 30 revealed no evidence of disease in the stomach. The gall-bladder investigation with Graham dye was also negative. The jaundice increased and the patient developed a firm hard mass below the right costal margin. An aspiration biopsy of the mass was carried out. The histological sections revealed primary carcinoma of the liver (hepatoma).

During this period the fasting blood sugar levels were somewhat lower, with an occasional estimation of 70 mgm. The insulin dosage was gradually reduced to 5 units of protamine zinc insulin, but blood sugar continued to decrease from 125 mgm. to as low as 45 mgm. per 100 c.c. of blood. Insulin was discontinued one month before death and the patient was placed on a high carbohydrate diet. The fasting blood sugars on this routine were 36, 62, 55 and 46 mgm. The patient



exhibited few symptoms of hypoglycæmia except weakness and fatigue.

Post-mortem findings.—The autopsy, performed by Dr. M. K. Campbell, 24 hours after death, presented a poorly nourished Chinese male with deeply jaundiced skin and scleræ. The cervical axillary and inguinal lymph nodes were not enlarged.

On opening the chest cavity the heart was found displaced to the left. About 1,700 c.c. of slightly cloudy, bronze coloured fluid was present in the right pleural cavity. Adhesions were present in right pleural cavity over the upper and lower lobe. The right lung showed small areas of caseation in the upper and middle lobe. In the lower lobe there were large consolidated areas which on cross section showed caseation and, in some areas, calcification. The left upper lobe was consolidated and a 2 cm. cavity was present with several small cavities situated peripherally. A 1.5 cm. cavity was present in the apex of lower lobe but otherwise the lower lobe was well aerated. The mucous membrane of the trachea and the larger bronchi was injected and the subepithelial tissue was increased in thickness but no evidence of ulceration was demonstrated. Two tracheobronchial lymph nodes were present at the bifurcation of the trachea. One measured approximately 4x1x0.75 cm., was black in colour, but otherwise presented no abnormality on cross section. The other gland was slightly smaller and very firm. The external surface was black in colour and, on cross section, the centre of gland was made up of calcified material surrounded by a rim of black lymphoid material.

About 300 c.c. of ascitic fluid was present in the peritoneal cavity. The liver was tremendously enlarged, extending 11.5 cm. below the mid-clavicular line and 9.5 cm. below the mid-sternal line. The right leaf of the diaphragm extended upwards to the 5th intercostal space and the left leaf to the 6th interspace. The lower edge of the liver was irregular and the anterior surface nodular (Fig. 2). The liver weighed 3,625 grams and measured 23x19x12 cm. There was no enlargement of the portal lymph nodes. On section, most of the normal liver tissue had been replaced by firm nodules varying in diameter from 0.5 cm. to 12.5 cm. Only a small section of normal liver tissue was found in the left lower lobe. Microscopic examination of the tumour tissue revealed cells which were larger and more deeply stained than normal and which in various sections formed thickened liver cords (Fig. 3). The nuclei were irregular in size and shape with extremely large nucleoli. A few mitotic figures were noted. The blood vessels varied greatly in size and were irregularly placed. Areas of hæmorrhage and necrosis were present in some of the sections of tumour tissue.

The œsophagus presented no abnormalities. The stomach was markedly distended and the blood vessels beneath the mucosa were greatly increased in size, but no bleeding points were noted. No abnormality was noted in the duodenum, jejunum, ileum or large intestine. The mesentery was slightly increased in thickness and a few small, rounded, firm nodules, the size of a small pea, were present. On cross section these nodules were homogeneous and light yellow in colour. The gall bladder was of the usual size and the bile ducts were patent throughout and were not enlarged. The spleen was enlarged and flabby. It weighed 260 grams, and on cross section showed an increase in the amount of connective tissue. The sinusoids were deep, dark red in colour and did not stand out upon the cut surface. Very few Malpighian bodies were noted.

The pancreas weighed 70 grams and was somewhat thin and flabby, but otherwise presented no gross abnormalities. Microscopical examination revealed fairly

well preserved islands of Langerhans with no round-cell infiltration or sclerotic changes in capsule. The adrenals were much smaller than usual. The right adrenal weighed approximately 4 grams. The cortex was extremely thin and small. Grey-yellow areas, the size of a pin, were seen in the cortex. The medulla was also extremely thin and free blood was encountered. The left adrenal presented a similar picture.

Both kidneys revealed several small cysts varying in diameter from 1 to 3 mm. on stripping the capsules. A few small tubercles were present at the lower pole of the right kidney and a small caseous area was noted at the junction of the cortex and medulla in the lower pole of the left kidney. The bladder showed an elevated plaque about 1 cm. in diameter above the opening of the urethra. Three small nodules were seen immediately adjacent to this plaque. The prostate was firm but not enlarged. It was smooth and regular in outline. No abnormalities were noted on cross section.

The brain weighed 1,440 grams. The cerebrospinal fluid was slightly cloudy and increased in amount. The blood vessels were somewhat engorged. No tubercles were noted over the vault and no exudate was found at the base of the brain. The convolutions were well marked. No abnormality was noted in the sinuses.

The anatomical diagnosis was primary carcinoma of the liver; tuberculosis of lungs, tracheo-bronchial lymph nodes, kidneys and urinary bladder; pleural effusion (right); gastric varices; peritoneal effusion; œdema of brain; and congenital cysts of kidneys.

COMMENT

A review of the literature reveals numerous reports of hypoglycæmia in hepatic lesions as well as in primary carcinoma of the liver. Best and Taylor[4] stated that the hypoglycæmia occurring in liver disease is chiefly due to interference with the formation of sugar in the liver. This may be due to (1) abnormality of liver cells, (2) inhibiting action of insulin on gluconeogenesis in the liver, and (3) the decreased hepatic gluconeogenesis resulting from diminished output of anterior pituitary, thyroid, or cortical and medullary adrenal secretions. Spontaneous hypoglycæmia was classified by Best and Taylor as due to (1) hyperinsulinism, (2) hypofunction of anterior pituitary, adrenals or thyroid, (3) interference with gluconeogenesis in liver (experimentally demonstrated in hepatectomy, interference with arterial blood, food poisoning and deposition of fat).

The experimental work by Mann[18] on hepatectomized dogs has provided the basis for the recognition of hypoglycæmia as a distinct clinical syndrome. Mann showed that the acute collapse of the dogs was associated with the reduction of the blood sugar level and that the animal could be revived by the administration of dextrose. Mann's work also demonstrated the tremendous reserve power of the liver and as a result there is a tendency to disregard the rôle of the liver in spontaneous hypoglycæmia. Nevertheless, Coller and Troost[10] pointed out that the disturbance in carbohydrate mechanism in a glycosuric patient with a low fasting blood sugar is most likely to be of hepatic origin. Best and Taylor estimated that approximately 80% of the normal liver must be removed before hypoglycæmia is produced. In primary carcinoma of the liver, however, Greene[14] reported that hypoglycæmia occurs even though there is enough normal liver tissue present to carry on all liver functions, as well as to guard glycogen storage balance.

Clinically, spontaneous hypoglycæmia is not characteristic of any specific lesion. Hyperinsulinism, whether therapeutic or spontaneous from association with tumours or hyperfunction of the islands of Langerhans, is frequently reported. The diagnosis of hyperinsulinism, however, is exceedingly difficult and true cases are rare. Frantz in a review of the world's literature, found only 96 cases in which the diagnosis of hyperinsulinism had been proved at operation or necropsy. Pituitary and thyroid disturbances may also be accompanied by hypoglycæmia. Anderson reported a case of adrenal carcinoma with hypoglycæmia.

Low blood sugar estimations also may occur in diffuse parenchymal damage of the liver. This has been demonstrated clearly by surgical interference with the blood flow to the liver. In primary carcinoma of the liver the occurrence of hypoglycæmia has been noted in a number of cases. The literature also reports the association of hypoglycæmia with hepatitis, yellow fever, acute yellow atrophy, and with various poisonings including phosphorus, carbon tetrachloride, benzol, chloroform and synthalin.

The clinical manifestations of hypoglycæmia often present a wide variation in signs and symptoms. Hypoglycæmic symptoms often may go unnoticed even in patients with extreme liver destruction. The symptoms are usually sensations of extreme hunger, irritability and nervousness, fatigue, weakness, apprehension and blurring of vision. Trembling, profuse perspiration, pallor, tachycardia and palpitation may accompany these. Loss of consciousness and coma occur in the severe cases. Coller and Jackson[9] stated that the blood sugar is usually below 40 mgm. when consciousness is lost.

Hyperglycæmia, according to Best and Taylor, may be produced by an over-production of glucose in the liver and excessive discharge from the liver. One of the main factors which stimu-

lates production is the abnormally rapid gluconeogenesis, due to overactivity of the liver cells produced by nerve impulses, toxic substances, and changes in hydrogen-ion concentration. From animal experiments Soskin[25] concluded that the normal liver is essential to the metabolic reactions which determine the normal dextrose tolerance curve, while the pancreas is not. Bodansky[7] has demonstrated that moderate liver injury produces an increase in blood sugar. According to Peters and Van Slyke[21] high fasting blood sugar and spontaneous glycosuria are not uncommon in liver disease. Clinically, hyperglycæmia has been reported in various liver diseases. Butt and Wilder[6] reported diabetes mellitus associated with hæmochromatosis in 86% of their series and glycosuria in 78%.

SUMMARY

1. A case of primary carcinoma of the liver combined with tuberculosis and diabetes mellitus is reported.

2. The occurrence of hypoglycæmia and hyperglycæmia in liver disease is briefly discussed.

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RESISTANCE TO TREATMENT IN EARLY SYPHILIS*

By Frederick Kalz, M.D.

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RESISTANCE to therapy in early syphilis is, fortunately, rare. Moore[1] states that only one in five hundred will fail to react favourably to antisyphilitic therapy.

The following forms of resistance may be noted in the early stages of the disease: (1) The primary or secondary lesions fail to disappear during the arsenical phase of therapy and the *Treponema pallidum* may be found for a long period of time. (2) The *Treponema pallidum* disappears and the lesions involute during the period when arsenicals are given, but reappear when heavy metals are substituted. (3) Serological reversal is not achieved and there is no decrease in the titre of the reagins in the serum. (4) Clinical relapse occurs suddenly during or after the termination of therapy. (5) Serological cure is achieved, but serological relapse occurs during or after the termination of therapy.

Some authors claim that such cases have been more frequently observed in recent years, and speculation has arisen as to the possibility of the development of an arsenic-fast strain of *Treponema*. Such claims have not been substantiated on this continent.[2]

Analysis of such cases observed in the treatment centre at the Royal Victoria Hospital has led us to believe that most of these therapeutic failures are due to inadequate dosage of arsenicals during the first months of infection. During the last five years, a more intensive, routine treatment scheme has been used for treatment of early syphilis. Mapharsen (0.06 gm.) is given twice weekly for ten weeks and bismuth subsalicylate (2 c.c.) is given once weekly, beginning in the ninth week, for six weeks; this is followed by a second course of mapharsen twice a week for ten weeks, again overlapping the bismuth course in the 23rd and 24th weeks. Alternating and overlapping courses of mapharsen, 0.06 gm. once a week and bismuth subsalicylate, 2 c.c. are given until therapy is concluded (total dosage being 50 to 60 mapharsen and 30 to 40, bismuth subsalicyl-

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ate). This scheme differs from the schedule advocated by Moore,[3] in so far as the bismuth overlaps the arsenical course.

As treatment for relapsing secondaries, especially ocular involvement, as well as other cases where strong arsenical therapy is indicated, arsphenamine has been routinely used for the last five years in an average dose of 0.4 to 0.5 gm. a week.

In over 200 cases of early syphilis, using the aforementioned treatment plan, not one instance of resistance to therapy has been observed, but several such cases have been referred to our clinic in which mapharsen or neoarsphenamine, in usual dosage, was given once a week only.

Resistance to treatment in early syphilis has not been observed, using the aforementioned treatment plan, but several cases have come to our attention in which other methods were used; in these neoarsphenamine or mapharsen was given once a week in usual dosage.

Resistance to therapy is a serious problem for physician and patient, and a menace from the public health point of view. A detailed report of three such cases follows and should be of interest.

CASE 1

J.F., a 36-year old Canadian of English extraction was first seen in June, 1940, complaining of a painful inflammation of the left eye. He stated that his blood Wassermann and Kahn tests had been negative in 1939 and that he had been exposed to syphilis in January, 1940. In February, he developed a primary lesion on the penis, spirochætæ pallidæ were demonstrated and the blood Wassermann and Kahn tests were found to be positive. Treatment was started in March by his family physician and he was given neoarsphenamine 0.6 gm., and bismuth subsalicylate, 2 c.c. once a week for two months; the bismuth injections were then continued for eight weeks, at which time his eye became inflamed and he complained of headaches.

Clinical examination at the time of his first visit to the hospital revealed no abnormalities, other than an acute syphilitic iridocyclitis and a significant general lymphadenopathy. The primary had healed and examination of the spinal fluid was normal in all respects, but the Wassermann and Kahn tests were positive.

Treatment was started with arsphenamine 0.4 gm. and after two injections, the ocular relapse was healed. The Wassermann and Kahn tests were found to be negative after the second course of arsphenamine, 24 injections, and remained so. Spinal fluid was re-examined after the fourth course of arsphenamine and again found to be negative. Treatment was discontinued in October, 1941.

Recent examinations revealed negative serological tests, and no evidence of any syphilitic activity. Fluoroscopy of the aorta showed no abnormalities.

CASE 2

E.D., a 32-year old French-Canadian was first seen in July, 1941. He stated that he had had an ulcer on his penis in June. Examination revealed a healing indurated lesion on the penis, and his palms and soles were covered with indurated, brownish-red, shiny papules of very typical appearance. There were a few discrete papular lesions on the flexor surfaces of the extremities and the chest. No mucosal lesions were observed. The blood Wassermann and Kahn tests were positive.

Treatment was started with mapharsen, 0.06 gm. and the patient was told to attend clinic twice a week, but he refused and attended once weekly. The primary lesion healed and the papules on the soles and palms showed some tendency to involute. After fifteen weeks of treatment new lesions appeared on the forearms, which spread rapidly, and he complained of severe nocturnal pain in the medial part of both tibiæ. He was admitted to the hospital and examination revealed numerous ulcerating lesions on the forearms, some of them with a punched-out appearance varying in size. Some smaller papules with necrotic centres were noted and the plantar and palmar lesions were still present. He felt weak and ill and suffered considerably at night with periosteal pains.

The quantitative Wassermann reaction was positive to 1:65 and the Kahn test was positive. Examination of the spinal fluid revealed no abnormalities and repeated darkfield examinations of serum from the gummatous lesions were negative. A hæmogram showed some anæmia and a picture compatible with that of syphilis. Roentgen examination of the long bones did not reveal any abnormalities. A biopsy from an ulcer on the elbow showed a hyperplastic, exudative and proliferative inflammation with evidence of endarteritis and perivascular infiltration. No spirochætes were found.

Treatment was started with arsphenamine at once and after the second injection the pains had vanished. The skin lesions healed rapidly, and after five injections all symptoms had disappeared. Alternating courses of arsphenamine, 0.5 gm., 34 injections in all, and bismuth subsalicylate, were given, followed by a course of neoarsphenamine 0.75 gm. and another course of bismuth subsalicylate. The Wassermann test became negative during third course of arsenical and repeated serological examinations have been negative.

CASE 3

J.C., a 29-year old French-Canadian developed a primary lesion on his chin with a hard regional lymphadenopathy. Spirochætæ pallidæ were demonstrated and treatment was started by the family physician. The blood Wassermann and Meinicke tests were negative. He was given weekly injections of neoarsphenamine, the initial dose being 0.3 gm.; this was gradually increased until he was receiving 0.75 gm. The primary sore healed quickly, but after twelve injections lesions appeared on the penis and he suffered with nocturnal pains in both legs, these being particularly troublesome after a long day on his feet. The patient came to my office in November, 1941. He was pale, felt ill, and complained of severe pain in the tibial region of both legs. There were several, small, slightly eroded papules on the penis and numerous typical mucous patches on tongue and gums. Large numbers of spirochætes were found in both mucosal patches and penile lesions. No periosteal hyperplasia was felt and the bones were not sensitive to pressure.

Clinical examination did not reveal any abnormalities, other than a positive Rumpel-Leeds test. The liver was not palpable and his blood Wassermann and Kahn tests were negative. The Kline exclusion test was repeatedly negative.

Treatment was started with mapharsen, 0.06 gm., twice weekly, and penile lesions and mucous patches healed in two weeks. The periosteal pain disappeared after six injections, but during the first two weeks of treatment, he complained of severe pain immediately after the injection, which lasted for two hours. After four weeks of treatment a positive Kahn reac-

tion occurred, but all subsequent tests were negative. Examination of the spinal fluid was normal in all respects. A hæmogram revealed a neutrophilia with slight lymphocytosis and monocytosis; coagulation time was delayed and the prothrombin time was 47 seconds. Vitamin C was prescribed and in three weeks the Rumpel-Leeds test was negative. After six weeks there was a marked improvement in the patient's health, with a gain in weight. Patient received two courses of mapharsen, 0.06 gm., twice a week for ten weeks, two courses of mapharsen 0.06 gm. once a week for ten weeks, making a total of sixty arsenicals. After each course of mapharsen he received weekly injections of bismuth for ten weeks, making a total of forty bismuth injections.

All subsequent examinations, to date, have been negative and no signs of any syphilitic activity have been found.

DISCUSSION

Case 1 displayed an ocular relapse occurring after insufficient treatment and "cure" after intensified arsphenamine therapy.

Case 2 developed a periostitis and precocious tertiary skin lesions while receiving weekly injections of mapharsen 0.06 gm., but responded well to intensive therapy with arsphenamine.

In Case 3, resistance to neoarsphenamine, 0.75 gm., given once a week, was observed and mucous patches and papular secondaries with spirochætes, and periostitis developed in spite of regularly given treatment. An interesting feature was the persistent seronegativity. Symptomatic cure was achieved with mapharsen, 0.06 gm., twice a week.

In all three cases therapy, previously considered as adequate, failed to arrest progression of the syphilitic infection, while intensified arsenical therapy brought about clinical and serological cure. While this paper was at the printers, an interesting report by Beerman, Ingraham and Pariser[4] was published. In nearly all these cases, therapy was instituted in a cautious manner and dosage was very small.

In addition to these and other cases of resistance to therapy and clinical progression, numerous cases have been observed among our patients, in whom mapharsen, given once a week, failed to reverse the positive blood tests, while more intensive therapy with either mapharsen or arsphenamine brought about serological reversal in a short time in most instances.

If general improvement, serologically or otherwise, does not occur with intensified therapy and change of drug, such measures as injection of foreign protein, ultra-violet ray therapy and high vitamin intake may prove of value. If not, fever therapy, preferably artificially induced, in conjunction with arsenotherapy, may be tried. In most cases, however, if patients are adequately treated during the early stages of their syphilitic infection, such measures as above outlined would be unnecessary. To date, using mapharsen 0.06 gm.* twice a week, we have not observed any cases of resistance to treatment in primary or secondary syphilis in the treatment centre at the Royal Victoria Hospital. Mapharsen 0.06 gm., once a week is considered as insufficient for treatment of early syphilis.

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RÉSUMÉ

Il appert que les échecs thérapeutiques dans la syphilis précoce,—primaire ou secondaire,—sont dûs à l'insuffisance des sels arsénicaux employés. Il convient alors d'augmenter les doses ou de changer le produit arsénical utilisé. Le bismuth sera donné en concomitance à doses convenables. Parfois, le traitement agira mieux si l'on injecte au malade, au surplus, des protéines étrangères, si on le soumet aux rayons U.-V., si on lui fait prendre un régime alimentaire richement vitaminé.

JEAN SAUCIER

* Clorarsen, phenarsine hydrochloride, donated by Squibbs, was used in some cases in a dosage of 0.067 gm., twice a week and no appreciable difference was noted in therapeutic effect.

DISCUSSION OF SOME COMMON CONDITIONS, GENERALLY UNRECOGNIZED OR UNTREATED. BASED ON THIRTY YEARS' CLINICAL EXPERIENCE*

By W. A. Bigelow, M.D.

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THIS paper is purely clinical. I shall deal with the following list of conditions with which we have had experience in our clinic during the last thirty years. (1) A type of pancystitis; (2) the colon bacillus; (3) residual urine; (4) urachitis; (5) detached costal cartilage; (6) some diagnostic uses of novocain solution; (7) the diagnosis of pelvic varicocele or painful ovarian sympathetic plexus; (8)

* From the Bigelow Clinic. A paper read at the Annual Meeting of the Canadian Medical Association, Manitoba Division, September 20, 1943.

neuralgia of the pudendal nerve; (9) perityphlitis and right-sided pericolitis; (10) a certain type of pruritus ani.

PANCYSTITIS

A common type of this is the small contracted bladder which becomes painful on filling. I am not referring to the type found in tuberculosis, or associated with a pronounced prostatitis and cystitis, or with a definite pathological urine. The type of case to which I refer is found in that large group of people scattered all through our country and cities who complain of day-frequency of urination, sometimes associated with one or two nightly voidings. The pain is suprapubic and comes on only when the patients try to extend their time-periods between voids. They generally empty the bladder every one or two hours, to keep comfortable. The examination of the urine is generally negative. Possibly an occasional pus cell is seen. Examinations of prostate and pelvis are normal, and the patient presents no other subjective or objective symptoms. Very frequently he consults the urologist and is given no relief. No doubt you have all met these cases and the general practitioner can, without any very special apparatus, generally diagnose and cure them in his own office. They are frequently referred to us for prostatic treatment.

These patients have been given at our clinic a thorough urological examination, and they show nothing abnormal as a rule, except in an occasional one a crack in the mucous membrane at the point of dilatation of intolerance, which crack will bleed a little as it is stretched. If you have a patient presenting the subjective symptoms described, with nothing pathological in the urine, then just try this:

First, have the patient empty his bladder. Take an irrigating can, either of glass or having a glass window in order that you may watch the water level. Measure off on the irrigator the graduated capacity at five-ounce intervals up to 25 or 30 ounces, having the figures large enough to be read at six or eight feet distance. Fill the can to the 30-ounce level with boracic acid solution. Elevate the can five and a half to six feet above the patient, who is lying down. A rubber tube, seven or eight feet long, with an ordinary glass irrigating nozzle at the end is attached.

Having this ready, write down on a pad the ounces indicated at the water level. Next, have patient empty his bladder. Then inject into the bladder one ounce of boracic solution with four or five grains of cocaine dissolved in it. Boil a soft rubber catheter, any size from 18 to 22 French, and about ten minutes after the cocaine instillation, pass the catheter and you will now see that the bladder is empty. Insert the nozzle into the end of catheter and turn on the water. Allow this boracic solution which is at body temperature to run slowly into the bladder, and when the patient complains of pain with a desire to void then immediately clamp off the water and write down the water level in the irrigating can. In these cases the pain and desire usually start at four to ten ounces. With this marked down, open up the clamp again and allow the bladder to fill up to the point of intolerance. Then note the water level and allow the bladder to empty.

It should be explained to the patient what you are trying to do and that his cure depends on how much stretching he can stand. If he cannot take it, then you will have to use once or twice a short general anæsthetic just for five minutes. Many of these people find the point of capacity intolerance at from nine to sixteen ounces. A primary dilatation of fifteen ounces is excellent, and a few dilatations at weekly intervals will soon cut down the frequency to three to six hours. You will be surprised how often a patient will return after one primary dilatation and state a great improvement.

The earlier cases distend with two or three treatments up to 20, 21, and 23 ounces. This is a sufficient capacity to give them a normal frequency and no pain. About 50% will come in this class. Other more intractable cases will need a dilatation every week for two or three months. About 15% will need a general anæsthetic for the primary dilatation. We always stop the primary dilatation at twenty ounces, either with or without an anæsthetic.

Sometimes after a particularly painful dilatation the last three or four ounces of return water will be coloured from a bleeding crack in the mucosa previously mentioned. I have had no great inconvenience from this in twenty years of performing this little operation.

Rupture of the bladder with this method has occurred only once in my experience. That was in a hospital where I used a Triumph

syringe to force the dilatation. It has never happened at six feet elevation. Remember to tell the patient that the first dilatation is the worst. We frequently supplement this treatment with x-ray sedation.

COLON BACILLUS

At this clinic since 1915 the urine of all patients suffering from any chronic condition or preliminary to any surgery, is collected aseptically and cultured. We were struck with the frequent presence of colon bacilli in the urine of those patients who had nothing else wrong with the urine. A large number of people suffer from attacks of bladder frequency due to colon bacilluria, and generally associated with alkaline urine. So with these cases, try sulfathiazole, gr. xv, t.i.d., for two days and it will often clear up this frequency. Of course, in giving sulfathiazole, watch for backache and blood cells in the urine. If the sulfathiazole dosage is limited a concentration test will probably be unnecessary.

RESIDUAL URINE

During examination of the prostatic or any bladder case not acutely infected, always test for residual urine. This is rarely done by the general practitioner and it helps to decide whether the case is in need of some more radical treatment.

URACHITIS

This is a condition which we run across quite often. Last winter we had two of these in one week. It is nearly always diagnosed as an intra-abdominal trouble, or a bladder trouble. The patient complains of a pain in the midline of the lower half of the abdomen extending from the symphysis up to nearly the navel. This pain is worse when the bladder is full, also while emptying. If the midline between the two recti muscles is palpated a hard line the size, nearly, of a lead pencil, is felt which when pressed on and moved produces the pain complained of. Have the patient half raise himself and the urachus will still be found to be painful and a little more so than while lying. We have demonstrated this condition in one case on which we had to do an abdominal operation for other reasons, and found a large inflamed urachus.

Hot fomentations, diathermy and x-ray treatment clear these up in a week or ten days.

THE DETACHED COSTAL CARTILAGE

This is a very common cause of irritation to the eighth, ninth, and tenth intercostal nerves, producing a spasmodic intercostal pain and neuralgia, generally brought on by certain movements of the body. One of these cartilages by trauma becomes separated from its fellow above; consequently this free costal cartilage tip is free to move with certain body movements and presses on the intercostal nerve above, producing pain. It is strange how many of these cases are diagnosed as toxic intercostal neuralgia, or even pleurisy, gallbladder trouble, splenic pain, and so on.

When a patient comes complaining of a pain at the edge of the ribs, having a definite relation to body movements, sneezing, twisting, just take the clothes off and have the patient lie down. Then go over these cartilages and make sure that one of them is not loose. If so, you can produce the pain by manipulating the cartilage.

The treatment for this is to remove the cartilage. This is easily done under a little novocain solution.

SOME DIAGNOSTIC USES OF NOVOCAIN SOLUTION

This simple and safe solution can be used in many places and ways as an aid in diagnosis. For instance: (1) To differentiate an intercostal nerve pain from visceral pain in heart, lungs, or gallbladder. If the tender or painful area can be palpated then inject this intercostal nerve, and if the pain disappears the diagnosis is generally made. (2) To diagnose a neuralgia due to a separated cartilage, inject the nerve at the painful area, then, if the cartilage is the cause, the pain will not be produced by manipulation. (3) The injection of an ilio-inguinal or ilio-hypogastric nerve will often eliminate visceral abdominal trouble, renal or ureteric pain.

THE DIAGNOSIS OF PELVIC VARICOCELE OR PAINFUL OVARIAN SYMPATHETIC PLEXUS

These patients come frequently with a diagnosis of pelvic inflammation, appendicitis, or salpingitis. There are two points which are diagnostic.

First, the pain in pelvic varicocele always precedes the menstrual period for a period of a few hours to two or three days, and is relieved during the first, second, or third day of the menstrual period. It is also liable to come on

while standing any length of time or working on the feet, for instance, standing while ironing, sweeping, carrying loads. Secondly, the pain in pelvic varicocele, if uncomplicated by some accompanying inflammatory lesion, is made worse by heat. In the clinic we run a diathermy long or short wave through that side of the pelvis. This aggravates or starts up the pain in pelvic varicocele. But it is not necessary to have a diathermy machine on hand. Just ask the patient to go home and take a good hot vaginal douche at a temperature of 120° F., and if the heat increases or brings on the pain then pelvic varicocele instead of some inflammatory lesion must be considered. The simplest treatment which I know will cure this dragging-down fulness-pain is a sympathectomy, or a ligation and section of the ovarian vessels high up above the suspensory ligament.

NEURALGIA OF PUDENDAL NERVES OFTEN ASSOCIATED WITH A BURSITIS UNDER THE ISCHIAL TUBEROSITIES

This is a common condition among farmers. I mention the condition because we have had many patients referred for some transurethral procedure to relieve it, thinking it was associated with prostatic enlargement or infection. This pain is generally described by the patient as outside and away from the rectum, or alongside it, or, it may be described as on his "sit down". It is worse while sitting and when his bowels move. It is absent or easier while standing or lying.

Examination of these cases shows everything normal in rectum, prostate, and pelvis. Put the patient on his face, and palpate Alcock's canal area, making pressure firmly outward against the inner border of the ischial tuberosity. If you produce the pain complained of you may consider this a neuralgia of the pudendal nerve. In some of these cases one can distinctly feel a tender distended bursa associated with this condition. This is known of old as the "weaver's bottom". But the greater number of our cases show no palpable signs of bursitis, so that I am inclined to think this is a neuritis or neuralgia. One could enumerate many causes for this pain. It generally is bilateral. Our cases have been confined to men, except one.

This pain can generally be cured by single or repeated injections of novocain. On a few we have used three minims of alcohol. With the patient lying on his face, take 10 to 20 c.c. of a 1% solution of novocain. Using a small needle two and one-half inches long, insert it over and internal to the tuberosity of the ischium, directing the point as near to Alcock's canal as possible. Then, by feeling with the needle against the bone you will find the tender nerve and inject it the moment the pain is produced. Infiltrate this area with 10 or 15 c.c. of 1% novocain. One injection has cured a number of these cases. Others have two and three injections. If the pain returns I inject two or three minims of alcohol into this area, but always put a small quantity of the novocain in first, before injecting the alcohol. There are the odd stubborn cases in which we use x-ray therapy. But the great number of these can be relieved as described in the office.

PERITYPHLITIS AND RIGHT-SIDED PERICOLITIS

This common condition is generally diagnosed as acute and also chronic appendicitis. Acute abdominal pain starting on the right side is rarely appendicitis. With the tenderness also present on the right side and some temperature these cases are generally diagnosed at once as appendicitis and sent into hospital for operation.

In a recent series of 29 cases, only in two could we make a diagnosis of appendicitis, and these two proved to be appendicitis. Three others were operated on, on the insistence of their physicians. An appendectomy was done in these three cases and no appendicitis was present. The cæcum showed the usual reddened banded appearance. I believe that a more careful picking out of the first symptom will decide in most cases the diagnosis between these two conditions, as the acute appendicitis nearly always starts off with an ordinary ache or cramp. These acute cases clear up in eight to ten days by rest in bed, hot fomentations to right side, fluid diet, liquid paraffin, and any medical treatment indicated for distension or gas.

This so-called chronic type of right-sided pain, which in an otherwise healthy individual is made worse by jumping, jolting, riding horseback, riding in cars, on farm machinery, or over rough roads, is due to the mechanical pull by these bands. Just roll the patient on his left side. Then draw down and inward starting at the hepatic flexure, then the ascending colon, and then the cæcum, and in one or

more of these pulls or drags you will produce the pain complained of. This is rarely appendicitis. The cure for this is surgical only; but not in the acute stage.

A CERTAIN TYPE OF PRURITUS ANI AND VULVÆ

I am not referring to the types of pruritus so common in diabetes and in malignant disease, but to a type commonly encountered which presents no very definite etiology. We have used this treatment to clear up many cases of pruritus after the sugar is under control, and x-ray treatment has failed.

This treatment is not original. To my knowledge, it was first introduced at an American Medical Association meeting at Minneapolis in 1927, and afterwards published. After hearing this paper, I have used this injection method ever since, having modified it by adding a 1% solution of novocain to the regular hydrochloric acid solution of one in two thousand.

This common, exasperating, chronic irritation which can ultimately break down the patient's health and disposition can be given relief and at least 90% of the cases cured. After finding the urine, rectum, and pelvis normal in an apparently healthy individual, and the usual ointments have failed, then do this:

Make up two or three hundred c.c. of hydrochloric acid 1:2,000 in sterile distilled water. Of this sterile solution take 50 to 70 c.c. and add to it about 15 c.c. of 1% novocain. Use preferably a 20 c.c. syringe and two needles, one the small hypodermic needle, the second one, about two inches long, as is used for local anæsthesia. Put the patient on the abdomen and have him or her retract the buttocks by using both hands, one on each side. Clean off the skin with alcohol, then paint with a 10% solution of mercurochrome. Finally, an absorbent plug soaked in mercurochrome can be placed against the external sphincter ani or between the labia. Do this before loading up your syringe.

The plan is to intradermally infiltrate to the greatest degree all the affected skin area. The next thing to bear in mind is to infiltrate all the subcutaneous tissue in the affected area. I, personally, do only one-quarter of the area at a sitting. So, divide the whole field into quarters and do one thoroughly. Make your first injection deeply so as to get the pudendal nerve, as it lies in or leaves Alcock's canal, and try either to block off or locally infiltrate all the subcutaneous nerves in this area. Use about 25 to 30 c.c. of the solution in doing this. Then take the smaller needle and very thoroughly make an intradermal infiltration of your marked-off area. Be sure and go into the mucocutaneous junction. This time you have used about 50 or 60 c.c. Tomorrow do another quarter area in exactly the same way, continuing daily for the four days. Have the patient come in again in one or two days to find out any little spots you have not touched, and infiltrate them again as well as the subcutaneous area. If this is not done thoroughly you will not get results. But you will cure them if you are painstaking and thorough. And I do not know of any class of patients who show more gratitude for their relief than these chronic sufferers.

FUNGUS INFECTION OF THE MOUTH AND THROAT AND NOSE AND EAR

By A. L. Yates, M.D.(Lond.), F.R.C.S.(Edin.)

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THE fungi which are parasitic on the human tissues are of two varieties. In the one, the fungus consists of a single cell which multiplies by division, an example of this variety being the *Torula*. In the other variety the fungus is more complex, and its life history begins when the spore of a fungus finds itself on suitable soil, when it sprouts and produces hyphæ. These continue to divide and branch and grow until the soil becomes unsuitable, when they in turn produce spores. The cycle then may be repeated. It appears that certain fungi, as for example *Monilia albicans* can retain their hyphal form for long periods and later change to a form in which the spores are produced in such large numbers that they dominate the picture.

The following report is based upon the microscopic findings in some twelve hundred cases in which the wet secretions from the mouth or throat or nose or ear were stained with polychrome methylene blue and upon some clinical and other tests.

The fungi which are dealt with in this report are *Monilia albicans, Torula, Aspergillus,* and *Microsporon furfur. Monilia albicans* is not uncommonly present in small numbers in the

normal mouth. It and the *Torula* can apparently resist the normal bacteriostatic powers of the secretion of the mouth and throat and nose. This secretion, however, apparently destroys *Aspergillus* and *Microsporon furfur,* which I have never seen in the mouth, but which I have observed in many cases of abnormal ears and in a few cases of the dry form of nasal atrophy.

One of the features which has struck me in these examinations is that when the hyphæ of Monilia are present in large numbers, pathological micro-organisms such as streptococci are rarely demonstrable. This is in contradistinction to the condition when the hyphæ are sparse or absent and the spores are present in large numebrs, for, when this is the case, streptococci are not infrequently present in considerable numbers. Vincent's micro-organisms however are common in association with the hyphæ in cases in which there is evidence that these latter have been long established.

In the hyphal stage Monilia appears to flourish in such sequestered situations as the space between the margins of the gum and bodies of the teeth. It can be found in quantity in this situation when the gum margins have lost their sharpness and are swollen and rolled away a little distance from the tooth. In later cases it is found in pockets which have formed alongside the tooth, and there is some evidence that its presence in increasing quantity may be the cause of these in certain cases.

It can be destroyed by gentian violet, when the gums, after repeated applications of a 1% solution, will return to normal. When spirochætes appear the gentian violet will destroy the fungus, but not, apparently, the spirochætes. If salvarsan is used to destroy the spirochætes it has frequently little appreciable effect upon the fungi.

Seeing that every stage from monilial gingivitis to established pyorrhœa is recognizable, the question naturally arises as to whether the condition known as pyorrhœa is the end result of hyphal monilial infection. The evidence regarding this is suggestive, but inconclusive, but cases in which the gums show early signs suggesting pyorrhœa return to normal if a fungicide such as crystal violet is used upon the toothbrush. This is however not the case if Vincent's micro-organisms have already made their appearance. A substitute for gentian violet is, however, badly needed, for its colour and its taste are objectionable. Brilliant green and flavine are as powerful in action, but more difficult to remove if by accident the skin is stained. Many new forms of fungicides have been tried but all have so far proved ineffective.

In the tonsil the hyphal form of Monilia acts in somewhat the same way, for it finds its way into the crypts. In early cases in which it appears certain that the tonsil will require removal, painting with gentian violet will often cause the tonsil to return to normal.

Two questions arise here however, namely, is the fungus still so superficial that all of it can be reached by the penetrating gentian violet? If not, the fungus will go on developing in the deeper portions of the tonsil. In untreated and in unsuccessfully treated tonsils it is common to find that on removal their interior is filled with a pultaceous and stinking mass of Monilia hyphæ. The second question which arises is of more importance and is concerned with that of infection of the damaged tonsil. This seems to be most common when the contents of the tonsil contain large quantities of spores.

In the spore-producing form, the spores may lie upon the surface of the tissues and are harmless. In certain cases, however, they find their way into the bodies of the epithelial cells. At first the superficial layer of large cells is affected. Such infected cells may be seen in the secretion containing as many as a hundred spores within the body of the cell. In more advanced cases the cells are smaller and thicker, as if they came from deeper layers. These spore-laden cells from deeper layers have been observed not infrequently in cases of streptococcal infection and, in particular, in those cases which present the evidences of toxic absorption which collectively are known as rheumatism. There is no evidence whatever which suggests that the presence of the spores has anything to do with rheumatic manifestations, other than that, by causing desquamation of the deeper layers of epithelium, they increase the liability to absorption of bacterial toxins.

In certain cases in which Monilia can be demonstrated, the secretion, if rubbed into the skin which previously has been scratched, produces evidence of allergic sensitivity. This occurred in certain of the "rheumatic" cases and also, in more marked form, in certain patients with manifest allergic symptoms. Many of the cases showing this evidence of sensitivity had

given no reactions when tested with other allergens. Similar sensitivity has been noted in cases in which *Torula* or *Microsporon furfur* have been present in the secretions. In a few cases in which there was evidence of infection in addition to the fungus, and in which there was a marked response when the secretions were rubbed into the scratched skin, sterile bacterial cultures made from the secretion produced no allergic response. Fungi were, of course, absent from these cultures.

In certain patients suffering from a chronic cough of which the symptoms were those of intense laryngeal irritation with a negligible quantity of sputum, the secretion taken from the larynx revealed ciliated cells which had been desquamated and contained the spores of fungus. Coloured dye introduced into the trachea was lifted by the cilia of the trachea up to the posterior commissure of the larynx, but could only pass this if the patient coughed. In a normal larynx, anæsthetized similarly with pontocaine, the dye was carried freely past the posterior commissure by ciliary action. I thought at first that the stasis in the spore-infected case was due to desquamation of the cilia but the rapid rate of recovery from the cough, which had been present sometimes for many weeks after painting the larynx with gentian violet, convinced me that this could not be the case, for the cilia in this region take three weeks to re-develop if they have been destroyed.

Infections of the lungs by Monilia or Torula are not included in this report.

There are many causes of halitosis but in a certain group of cases the following was observed. In these the tongue was coated with a thick brown fur, which unlike that found in cases of gastritis contained the hyphæ and spores of Monilia in enormous quantities. The halitosis disappeared with great rapidity after one or two paintings of the tongue with gentian violet. It generally recurred and was again removed by gentian violet and after several such recurrences finally disappeared.

Cases of intermittent nasal obstruction and those in which the obstruction is recent but not intermittent and in which no polypi are present, fall into two main groups. A large group in which the patient gives positive responses to the ordinary tests for allergy, and a small group in which no allergen produces a response, but in which a brisk response is obtained when the patient's own nasal secretion is used in the scratch test. The majority of patients in this latter group had either Torula or Monilia in the nasal secretion, and the allergic symptoms were greatly reduced or cured by application of very dilute gentian violet to the nasal mucous membrane. A strong solution produces an attack of allergy, presumably because it kills and liberates a lot of fungus. I saw no case in which fungus was present in the nose where the fungus was not present in much larger quantities in the mouth.

The Torula fungus sometimes infects the mouth and nose and larynx or the ear and is never present normally in these situations. This yeast-like fungus grows in chains or clusters upon the surface of the mucous membrane where generally it does no harm, except that certain patients become allergic to it. The allergy if present may be of great severity. *Torula* was present in two cases of black tongue in which the adherent organisms formed chains and masses which looked like hairs. Among these there were pointed papillomata. One of these had to be removed and the Torulæ were found to have penetrated into the tissues so that they lay beneath the basement membrane of the epidermis. Cases of long standing are very resistant to treatment, but early cases are cured rapidly by salicylic acid and gentian violet applications.

In the ear the *Torula* fungus causes a thin dark brown secretion. This does no harm, but will recur repeatedly unless the ear is packed with fungicide of which mercurochrome or gentian violet are equally efficacious.

Microsporon furfur produces a powdery white lining of the meatus of the ear. In old-established cases the meatus becomes narrowed by thickening of the skin which lines it. This fungus has a strong tendency to spread to the skin of the pinna and the face. The pinna becomes thickened in neglected cases, while the skin of the affected portion of the face becomes parchment-like and wrinkled. From time to time this parchment area becomes pink and swollen and thereafter during its return to normal desquamates excessively.

Aspergillus fungus, when it affects the ear, mingles with the wax and its hyphæ grow between the cells of the epidermal lining of the meatus. The mass therefore becomes difficult to remove, and, when it comes away, it carries

with it a sleeve of epithelium. It rapidly recurs unless the skin of the meatus is treated with a fungicide. Cases that recur frequently are apt to develop a chronic progressive deafness, the result of pressure of the fungus on the tympanic membrane and on the structures in the middle ear.

When there is a discharging perforation in the drum head the *Aspergillus* fungus and *Microsporon furfur* do not appear to survive within the middle ear. The torula and, more rarely, the Monilia fungus may be found therein, and the former appears to pass for some distance into the mastoid. In such cases the patient is apt to suffer from severe headaches.

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THE CHINESE DOCTOR AND THE WAR*

By Robert B. McClure, M.D., F.R.C.S.(Edin.)

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THERE is in the Canadian physician today a keen and commendable interest in the life and welfare of his confrère in other lands. Insofar as I have been able to see this is fully reciprocated in most cases. It is perhaps timely to suggest that a series might be run in our medical journal giving something of the life, the problems, and the future plans of the medical profession in other countries such as Russia, Latin America and the Far East. It is to supply some of this background that this report from China is presented.

China is a big country and generalizations are all the more dangerous in a big country. Please keep in mind, therefore, that what are given here as generalizations do have their exceptions. The exception is all the more brilliant—and the more creditable—because the generalization is what it is.

The medical practitioner in China today is faced with three outstanding problems which are directly due to the war, so that whether he is in the far western provinces or nearer the area of military activity, and, however much he may try to avoid actual joining in the war, he is directly affected by these problems. These are the shortage of supplies, shortage of personnel, and inflation of currency. Beyond this he has, of course, the problems of the future pattern of medical practice and the post-war period generally to fill his mind. Thus, while he does not have the mental exercise offered by an income tax form, he yet has enough to keep away any tendency towards cerebral atrophy from disuse.

The shortage of supplies is a most formidable problem. It began almost as soon as did the war, but, fortunately, there were rather large stocks held for some time in the larger port cities of China. During the early days of the war and before the break in the Pacific it was mainly a problem of transportation and smuggling to get these stocks from Shanghai and Hongkong through the ever-constricting lines of communications to the user in the interior. Aside from the natural interference with these channels of communication caused by war there was a definite effort on the part of the Japanese to restrict drugs and supplies to China. This led to a great bootlegging system which exists to this day. China produces little in the way of western drugs so that she has always been very dependent on outside supplies. The mission, civil and military hospitals get their drugs from government and relief bodies, but these are not open in any adequate way to the general practitioner. He has had to resort, therefore, to merely writing for his patients the order for the drugs and letting them go on the open market or black market for their supplies. While in theory this may sound all right, yet in practice it is discovered that it is too much temptation to the doctor, and before long he gets into financial terms with the black market so that he gets a split in the fabulous price paid by the patient, and, in turn, only writes orders for those drugs that he knows his friend has on hand. The extent to which such abuses can grow in several years is alarming indeed.

The shortage is not only in drugs but in equipment. To the surgeon this may not be too acute, for he will be doing his surgery in some hospital and it will rest with the hospital authorities to get this needed equipment. Hospitals are mostly related to the government medical program in some way, so that, while they have nothing like adequate equipment, yet there is usually enough with which to carry on. The private hospital has almost passed out

* Dr. McClure prepared this paper while on leave in Canada from his work in China with the Friends' Ambulance Unit.

of existence, due both to inability to draw on public supplies and inability of patients to pay the fantastic fees that would be needed to make them run.

The tragedy lies unusually heavily on the young doctor now graduating. It is quite possible that in his medical course he has had inadequate training in anatomy, coming more and more to rely upon wall charts and less and less on the expensive dissection laboratory. In physiology the shortage of equipment has affected him so that he gets his instruction more by lectures and less by experiments. In pathology shortage of microscopes means again that he studies from pictures in books and on the wall. Finally, in his clinical work he could only have seen one or two chest pictures and fewer still stereoscopics of the chest, due to extreme shortage of x-ray films. His teachers have come to rely in x-ray work upon the fluoroscopic screen and diagrams of what they saw. It must be said that many of the clinicians have become expert indeed in the use of fluoroscopy in these days.

On graduation the doctor has difficulty in finding even a stethoscope on the market, while a hypodermic syringe and a clinical thermometer are major financial outlays. Conditions are even worse for the specialist. In obstetrics, forceps can be had that are locally made, but while they look all right in the shop they will bend at the first use. In ophthalmology and otolaryngology equipment is practically unobtainable. Added to this is the extreme shortage of medical literature, where the graduate finds on starting out that the textbook which he shared with his room mate during school cannot be divided easily among three of them and that medical journals are unobtainable.

All these factors combine to make it very difficult for a graduate to set up in private practice. His most simple solution is either to enter a partnership or get employment in an institution which will supply these things. Partnerships and "clinics" are not common for some reason or other. Even without any special legislation, therefore, institutional medicine in China is on the increase, at the expense of private practice. Inflation has altered, however, the rigid definition of "institutional medicine", as we shall see later on.

This shortage of supply and equipment is showing little sign of easing as yet. Japanese sources of supply are not so abundant as formerly and seem to be coming under more rigid control. Allied sources of supply are not available in such amounts as to allow their being supplied in any large way to the private practitioner. Even without any definite plan, therefore, "state medicine" of one kind or another is coming of itself.

Shortage of personnel shows itself chiefly in two ways. First, the doctor finds it difficult to induce and retain the services of any worthwhile nurse to assist him in his work. Similarly, for the well-established man the possibility for a junior partner is almost entirely out of the question. In the second place the doctor finds himself worked off his feet. He does more and more work in a less and less thorough manner. With the high cost of living he must take as many calls as possible, yet this can only be done with a lowering of the standard of service which he can give. The shortage of personnel also affects him in the matter of non-medical supporting staff such as orderlies, laboratory technicians and dispensers. Any one of these whom he trains for himself tends to leave at a much earlier date than formerly, to take more remunerative work, so that even by training his own staff he helps little to solve his own problem. He usually finds that he does have more hold on members of his own family so that it is not uncommon to find that the entire staff is made up of perhaps the doctor and his wife who is a nurse, a brother doing his laboratory work, a nephew in the dispensary, and an uncle looking after the accounts. Such a staff is much more permanent in its position. It does make for economy but lower efficiency, for while the whole family live and eat together yet it is, under such a family system, impossible to threaten with dismissal the orphan nephew who is the laboratory man even though he does not seem to pick up the same percentage of parasites as before.

Of the three factors that make life difficult for the medical man in China the worst is certainly inflation. Things are now costing something between 300 and 600 times their 1939 price. Add to this the fact that in medicine the urgency of the case gives the doctor a strong bargaining point. When life is at stake what patient is going to quibble about the price of a drug that he knows came through devious bootleg channels. However serious inflation may be, its great danger lies in its by-product. The lowering of morale is a far more serious

condition and it is here that the medical profession in China has yielded ground seriously. Practices that are more or less forced upon the doctor as a matter of necessity soon deteriorate until they become major "rackets". As one point is yielded in this fight it becomes more and more difficult to find a place to make a stand.

There are two ways to escape the evils to a certain extent. One is to give up medical practice entirely and go into other fields. One who was formerly one of the well-known public health men in China I found to be operating a lumber company. I believe, in justice to him that, since we had some talks, he is once more practising medicine. China seems to produce more doctors with administrative ability, so that these talents are highly prized in the commercial and industrial field of China today. The chemistry that he got in his medical course is a good qualification for him to be administrative head of such chemical organizations as a soap works or a paint factory. Some have gone into civil administrative posts and have made a fine job of them, too.

The other way out of many of the difficulties is to go into institutional work. Originally, all institutional jobs were full-time positions but with the coming of inflation and the need for the white collar worker to find other income the rules have not been altered, but it has become the practice to wink at private work taken on by institutional staff members. This has pyramided rapidly until now few of the institutions but are having serious lowering of efficiency within them. This is most serious in medical colleges and larger hospitals. Here the time that should go into working up the cases is given to out-calls. The result is that the student gets neither the time nor the interest of his teacher, but the former does get a great lesson in the wrong way by the example thus set. The temptations offered to the surgeon for an unnecessary operation and to the obstetrician for abortions under these circumstances are very large. Considering the temptations that exist, we must be very charitable in our judgment of these people.

To many visitors and to many of their own military men it seems that the medical profession has let the army down badly in its work of defending the country. It is easy to blame this all on to the "demoralized doctors", but the problem is not quite so simple as all that. Aside from a certain amount of demoralization there has been a combination of factors. Firstly, the doctor along with many others in the upper and middle classes of Chinese society, thought that the war, when it first broke out, would be fought by a group of people trained and appointed for that work. The military profession along with a large group of coolies employed by the government in the form of an army presumably would look after the situation.

As the war deepened it was seen that such a system would not work but it was hard to find a definite spot at which to change one's idea. Some doctors had that opportunity offered them as their former city was occupied by the enemy. On the other hand that was a very risky moment to make that decision, for there is inevitably a high mortality among those who make a patriotic decision at such a moment. Further procrastination led to a negative result so far as national service was concerned. Those who did wish to serve their country, and there were many at the early part of the war, mostly joined in the work of the Chinese Red Cross, and under the leadership of Dr. "Bobby" Lim have served continuously in that organization doing a most worthy but little publicized piece of work. The point of interest lies in the fact that rather few came to a late decision in this matter.

Secondly, the "system" under which the army medical services operate is inherently one that is not attractive. In order to prevent misuse of funds a great deal of red tape has been established. Political moves also play their part, and would usually be in the form of smearing the good name of the man whom they wanted to remove. The man thus lost both his job and his name at the same time. If he continued, he found the red tape most exasperating.

Thirdly, little effort was made to utilize the technical knowledge of the men to the full. Thus it should be possible to have a poorly trained doctor doing a good administrative job as head of a hospital, with the technical work in the hospital done by doctors with superior training. In practice that has not been possible. The technical superiority of the one soon wins him his place as head of the hospital where he is at once tied up with administration at which he may not be much good. The inferior man is left to do the technical work for which he is poorly trained. I believe that China is not

alone in these things. The result is an all-round inefficiency which soon makes both parties fed up.

Lastly there has been no scheme of national service, and army medical work did demand considerable financial sacrifice of those who took part in it. Many doctors have told me that they were quite ready to do their part so long as they were sure that the other fellow would also do his. Even today the one or two years of national service demanded from students as they graduate are usually taken in civil medical establishments. The fact, however, is that of all allied countries today probably the western trained doctor in China is doing least national service. On the other hand there can also be said for him that, due to the war, he has had a much rougher time than his confrères in any other allied country.

What of the future? Due to his Anglo-American training the Chinese doctor is today less public-health minded than his counterpart in many of the other revived countries. I do not mean that his public health technique is poor, but that he is lacking in a public health outlook to medical problems generally. It must be admitted that Anglo-American medicine has tended to produce a man ideally fitted for the practice of medicine as it has existed in our countries up to now. For instance, a perfectly well trained western doctor from a good medical college in America did very fine clinical work on 80 or 90 odd dysentery cases in a military hospital of about 200 bed capacity. He toiled endlessly at the job and never spared himself. He did this for two months before it was pointed out to him that nearly all his cases were coming from one battalion billeted some 6 kilometers up the road from the hospital. He had never thought to go and inspect their latrines and their kitchen facilities. Similar things happen all too frequently with the doctor trained in the Anglo-American school of medical thought. To meet the tremendous problems that face him I feel that the Chinese doctor must become more public-health minded; public health not as a technique of sewage disposal and milk supply but public health as a way of thought.

Not merely in spite of the war, but, actually due to the stimulus of war, China is today putting in a large system of civil hospitals some under federal control along the national highways and many provincially controlled hospitals in the districts farther back from the highways. These should be health units rather than mere hospitals as we understand them, and the shape of these may determine, more than we think, the type of medicine that will eventually be set up in China. The man with superior medical training should always be able to find his place in the training institutes of China. The post-war plan calls for large numbers of these. The Generalissimo gives China's urgent needs as some quarter of a million doctors to be turned out. Surely this is challenge enough for anyone in medical education. There is an interesting field in connection with health centres of mobile teams of specialists who could go from place to place, stopping a few days in each one, or to be on call for emergencies in the case of anti-epidemic teams. It seems to me that the medical centre in rural areas with mobile teams of various types making regular visits offers an economical solution for many of China's problems in medicine.

China is essentially a nation that follows "the middle way". In this she is, psychologically, much like Sweden. It would seem therefore that state medicine in any form in which it may come in China will not exclude private practice of medicine as well. If one can judge at all in this, as in many other forms of social organization planned for the post-war world, it is not a matter of "either or" but one of "both and".

Finally it would seem unsporting and out of place for medical practitioners in Canada to sit back in the midst of all the advantages which they have and point out the faults of our Chinese confrères. There are three things to be done about it. First; each one in Canada should do what he can to aid those agencies bringing medical relief to China. China War Relief Committee and Canadian Red Cross are both undertaking large programs of work in this field. Secondly; each should support those projects which envisage the bringing to this country, out of the China environment, selected Chinese doctors for postgraduate and "refresher" study. Thirdly; this should be a time of inward reflection for each of us, to see if we have within us those powers to resist the influences that have dragged down our profession so seriously in one of our allied countries. If we lack any special protective powers is it not the time to try and develop them in ourselves and in our profession generally, particularly among the young members who are joining our profession under our war-time conditions?

A TEST FOR INCREASED COAGULABILITY OF THE BLOOD*

By Theo R. Waugh, M.D. and Capt. D. W. Ruddick, R.C.A.M.C.

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FOR many years clinical interest in the coagulability of the blood has concerned itself, almost entirely, with the hæmorrhagic diatheses and abnormalities of one kind or another leading to a prolongation of the process of clotting. More recently, however, with the discovery of anticoagulants that can be employed therapeutically, such as heparin and dicoumarin, great interest has arisen in the subject of thrombosis and the relation of an increased coagulability of the blood to the development of this condition.

Unfortunately, the various tests that have been developed for measuring the clotting time, while satisfactory for demonstrating a prolongation of the process, do not allow for accurate measurement when acceleration occurs. This is due principally to the fact that the time under normal conditions is relatively short and unless influencing factors are very carefully controlled they are quite likely to accelerate the process to such a degree that the results are not dependable. These objections hold not only for those tests that are dependent upon the initial formation of fibrin for their end point, such as the use of a capillary tube, Bürker's method, the Boggs coagulometer, etc., but also for the congealing method of Lee and White. In all of these tests there is a comparatively wide range between normal limits. There would appear to be, therefore, an immediate demand for a method that would allow for much finer analysis of any shortening of the clotting time.

In an attempt to develop such a method, after a considerable amount of experimentation with various possibilities, it occurred to us that this might be accomplished by a controlled deceleration of the process. That is, if the coagulation could be put into "slow motion" as it were, finer changes would be magnified and thus more accurately measured. This, in fact, was found possible through the use of heparin, which apparently exerts its inhibitory effect by counteracting the action of thromboplastin. By this means, therefore, an indirect measurement of the thromboplastin content of the blood is obtained and, as theoretically an increase in the amount of this substance is the cause of accelerated coagulation, the desired result was achieved.

After trying the use of heparin in various quantities and different coagulation tests, and studying the effects of temperature, humidity, etc., on the process, it appeared that the congealing test of Lee and White lent itself most readily to modification and adaptation to our purpose and the method, the details of which are given below, was devised.

TECHNIQUE

The heparin used is that obtained from the Connaught Laboratories and having a potency of 1,000 units per c.c. Six-tenths of a cubic centimeter of heparin (600 units) are aseptically withdrawn from the vial, using a 1 c.c. tuberculin syringe to which a 22 gauge needle has been attached. This amount of heparin is then added to 300 c.c. of physiological (0.9%) saline. This is mixed thoroughly and results in a fluid containing two units of heparin per c.c. of saline. This is a stock solution. Eight small glass-stoppered bottles with large mouths (capacity 60 c.c.) are cleaned thoroughly, and subdilutions from the stock solution are made in them in the following manner:

1. Five c.c. of stock solution (containing ten units heparin) are added to 45 c.c. of saline, resulting in a sub-dilution containing 10 units of heparin per 50 c.c. of saline. This bottle is then labelled, No. 1, 1/10 unit per ½ c.c.

2. Ten c.c. of stock solution (20 units heparin) are added to 40 c.c. of saline. This is then labelled, No. 2, 2/10 units per ½ c.c.

3. Fifteen c.c. of stock solution are added to 35 c.c. normal saline and labelled No. 3, 3/10 units per ½ c.c.

In each subsequent bottle the amount of stock solution is increased by 5 c.c., and the saline is decreased by 5 c.c. until in the seventh bottle 35 c.c. of stock solution are added to 15 c.c. of saline. This procedure results in seven bottles containing concentrations of heparin which increase by 1/10 unit of heparin per ½ c.c. of saline in each bottle. The eighth bottle is then filled with saline to be used as a control.

This prepares sufficient fluid dilutions for at least 100 tests and when not in use the bottles,

* From the Departments of Pathology of the Royal Victoria Hospital and of McGill University.

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as well as the stock solution, should be kept in a refrigerator so as to maintain the potency of the heparin.

Nine Wassermann tubes (100 mm. x 13 mm. outside diameter) thoroughly cleaned and dried are placed in a special test-tube rack which has been constructed so that it rotates about a central axis (Fig. 1). The proper cleaning of the tubes is important. They should be treated with potassium dichromate-sulphuric acid solution, rinsed in hot water to remove all cleansing fluid, then after rinsing in distilled water, dried thoroughly with gauze. Using a one-half cubic centimeter or finely graduated pipette the fluids are placed in the test tubes as follows.

No. 1 tube (left hand side) is left empty.

No. 2 tube receives one-half c.c. normal saline (control).

No. 3 tube receives ½ c.c. heparin dilution from bottle No. 1, *i.e.*, 1/10 unit heparin per ½ c.c. saline.

No. 4 tube receives one-half c.c. heparin dilution from bottle No. 2. This procedure is continued, using corresponding heparin dilutions until tube No. 9 contains 7/10 units heparin per ½ c.c. saline.

The end result therefore is as follows:

Tube No.	*Contents*
1.	empty
2.	½ c.c. normal saline
3.	½ c.c. normal saline + 1/10 unit heparin
4.	½ c.c. normal saline + 2/10 units heparin
5.	½ c.c. normal saline + 3/10 units heparin
6.	½ c.c. normal saline + 4/10 units heparin
7.	½ c.c. normal saline + 5/10 units heparin
8.	½ c.c. normal saline + 6/10 units heparin
9.	½ c.c. normal saline + 7/10 units heparin

Corks are placed in each tube until the blood is to be added. Using a dry 20 or 30 c.c. graduated Luer syringe and a large gauge (18) needle, ten to twelve c.c. of blood are withdrawn from the arm vein of the patient. One c.c. of this blood is placed in each test tube which is then recorked. If the needle is left on, this can be measured directly from the syringe. Then the rack is agitated slightly so as to insure complete mixing of the fluid and the blood in the tubes. The time is then recorded and the actual test which is conducted at room temperature begins. The test tube rack is gently rotated in a clockwise direction every 2 minutes to an angle of 70 to 80° and the fluidity of the blood in each tube is noted (Fig. 2). The end point for each tube (congealing) is that point at which the blood no longer flows down the side

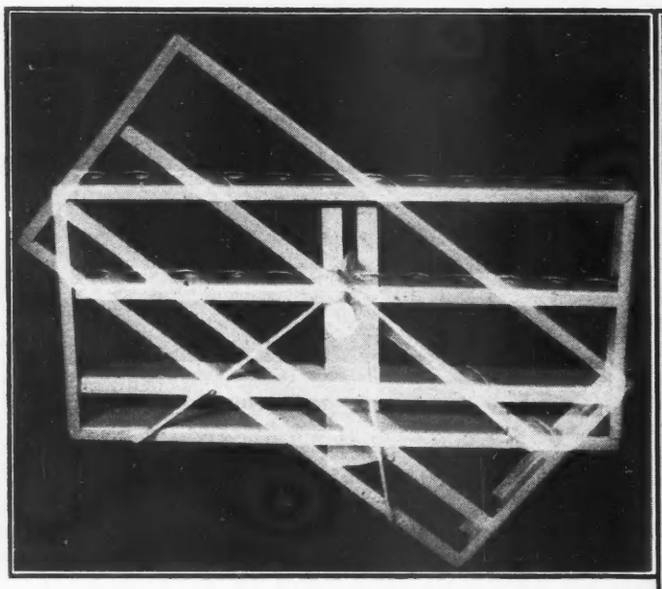

Fig. 1

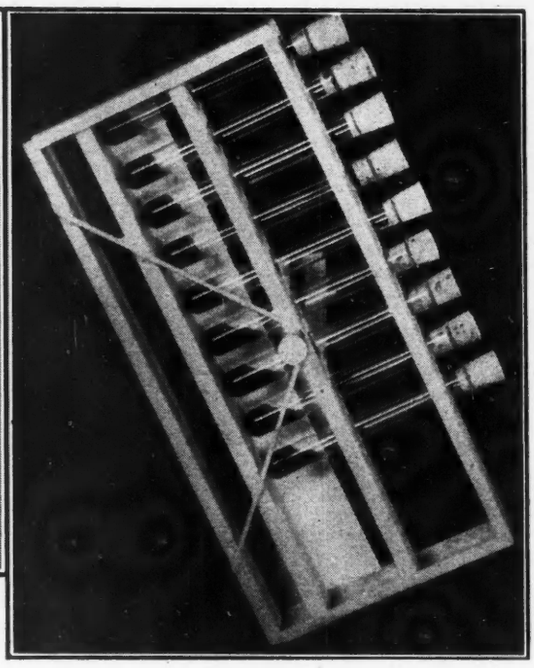

Fig. 2

Fig. 1.—Empty rack showing construction for rotation on central axis (double exposure).

Fig. 2.—Rack with tubes in rotated position. Congealing has occurred in tubes 1 to 5, but blood is still fluid in tubes 6 to 9.

of the test tube (modified Lee and White method).

Some difficulty may be experienced in determining the end point by those unfamiliar with the test. This is due, in part, to a fine membrane forming on the surface of the blood, which corking of the tubes helps to prevent. This membrane can be broken by rotating the test tube rack to the desired angle and maintaining this angle for 10 to 15 seconds. Another factor which may cause erroneous reading is that small deposits of fibrin sometimes appear on the surface of the tube over which the blood has flowed. This will disturb the smooth flow of blood and

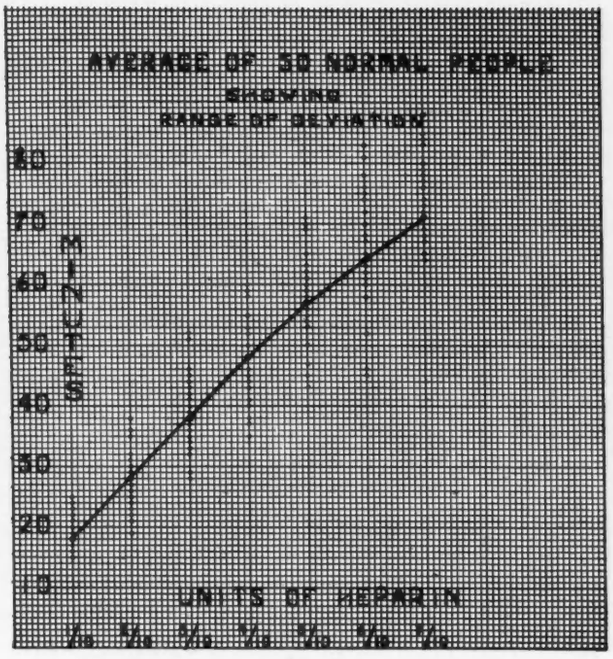

Fig. 3.—Graph showing results of test on fifty normal adults. The mathematical average is expressed by the continuous dark line.

can be prevented by rotating the individual tube in question in the rack or by rotating the rack in a counterclockwise direction thus allowing the blood to flow over a smooth clean surface on the opposite side of the tube. No. 1 tube congeals first in 5 to 11 minutes. This is followed by tube No. 2, then No. 3, etc., until the blood in every tube has congealed. The whole test usually requires approximately one hour. The time taken for each tube to congeal is then recorded on graph paper, plotting 1/10 units heparin against time in minutes.

Results in Normal Individuals

In order to establish the range of deviation of the graph using this test on normal individuals, fifty adults, ranging in age from 18 to 60 years and of both sexes were examined. The composite results are demonstrated in Fig. 3, with the mathematical average expressed as a continuous dark line. The shortest and longest times of congealing for each heparinized tube, together with the average time for the fifty individuals, are as follows:

	Shortest duration	*Average time*	*Longest duration*
Tube No. 3	10 mins.	18 mins.	25 mins.
Tube No. 4	19 "	28 "	38 "
Tube No. 5	29 "	38 "	52 "
Tube No. 6	35 "	48 "	60 "
Tube No. 7	43 "	57 "	70 "
Tube No. 8	52 "	64 "	83 "
Tube No. 9	64 "	71 "	88 "

This series of tests shows that while there is a certain amount of variation in normal adults the graph falls within quite well defined limits and these were therefore established as the bounds of normalcy. Any graph, the curve of which falls below these limits indicates an accelerated coagulability; while a slowing of the coagulation time produces the opposite effect. Occasionally the reading on a single tube will not fit into the general contour of the curve of the graph and should be neglected, as it is obviously due to an extraneous factor. If, however, the graph because of gross irregularity fails to demonstrate any definite impression of the velocity of coagulation, the test should be repeated.

We have now used this method for some time on clinical cases and have found that it demonstrates very satisfactorily an increased coagulability of the blood. Preliminary studies have shown that an acceleration usually is present (1) during uncomplicated bed rest; (2) following operative procedures, and (3) in the presence of acute infections. Many interesting observations of changes in coagulability have been observed in individual cases. These results, together with studies dealing with theoretical features of the test, will be reported in a subsequent paper.

Summary

The detailed technique of a method that allows for the demonstration of an increased coagulability of the blood is presented.

THE STANDARDIZATION OF BLOOD HÆMOGLOBIN DETERMINATIONS*

By H. Bruce Collier, M.A., Ph.D.

Halifax

THE inadequacy of the commonly employed methods for determination of blood hæmoglobin has led a number of workers recently to propose improved methods, and to seek a convenient absolute standard for these determinations. Rimington[1] has recommended the pyridine hæmochromogen method of Roets,[2] based upon pure hæmin as a standard. Clegg and King[3] have proposed an alkaline hæmatin method, also based upon pure hæmin. A number of workers, including Myers and Eddy,[4] and Karr and Clark,[5] have relied upon total iron determinations, which have been found to agree with estimations based upon oxygen capacity. A recent report to the Medical Research Council[6] recommends, as a standard, iron determinations upon washed erythrocytes.

The determination of blood hæmoglobin involves: (1) a convenient and precise method for routine measurements; (2) an absolute standard for calibrating the measurements. Our experience with various procedures, arising out of a study of phenothiazine anæmia, is outlined in the following experiments.

EXPERIMENTAL

The determinations were carried out upon human and dog blood. In each case venous blood was oxalated and was then diluted 1:10 with water, in order to facilitate precise sampling; all analyses were carried out on this resultant solution of hæmoglobin, using the same pipette throughout. Colorimetric measurements were made in a Lumetron model 401 photoelectric colorimeter, using ½ inch test-tubes and the green filter B530; transmission values were converted to extinctions by the formula $E = -\log T$. The results reported are averages of repeated measurements with a mean deviation of less than 1%. The results obtained by the various methods are illustrated in Table I, giving values for a sample of human blood and one of dog's blood.

Iron determinations.—Total iron was estimated upon 0.5 ml. samples of the diluted blood, using the wet ashing method of Myers and Eddy.[4] The pure iron standards (30 μg. Fe) for colorimetric comparison were always made up in the same amount of sulphuric acid as was used in the digestion. Since Bernhart and Skeggs[7] have found that pure hæmoglobin contains 0.340% iron, this figure was used in calculating hæmoglobin concentrations.

TABLE I.

COMPARISON OF HÆMOGLOBIN DETERMINATIONS

Method	*Hb. gm. per 100 ml.*	
	Human	*Dog*
Fe by mercaptoacetate.....	16.4	16.9
Pyridine hæmochromogen.....	16.6	16.7
Alkaline hæmatin (not corrected)..	19.9	20.5

Blood iron has customarily been estimated by the thiocyanate method, but this is very unsatisfactory for precise work (Hoffman[8]). Good results have been obtained with the mercaptoacetate method, following the procedure of Koenig and Johnson.[9] This reagent has the advantage of cheapness, relative freedom from interference, and acts as its own reducing agent. The method was applied to a sample of pure hæmin kindly furnished by Dr. E. J. King, and gave the same value, within 0.5%, as reported by him for Delory's[10] titanous sulphate titration. Mercaptoacetate is somewhat less sensitive than *o*-phenanthroline or dipyridyl, giving about two-thirds the colour intensity under our conditions. The use of phenanthroline in determining blood iron was found to give results about 2% too low, while dipyridyl gave, in one case, a value 10% too high.

Preparation of hæmin.—Pure hæmin was prepared from washed dog erythrocytes by the method of Delory.[10] The iron content of the crystals was found, by the colorimetric method described above, to be 8.27%. Recrystallization by Delory's method resulted in a product containing the theoretical amount of iron, 8.57%. This pure hæmin was used as an absolute standard in the pyridine hæmochromogen and alkaline hæmatin methods described below. The hæmin crystals supplied by Dr. King (containing 8.45% iron) were also used in these two methods and gave identical values, within 1%.

Pyridine hæmochromogen method. — The method of Roets[2] was modified as follows. To about 7 ml. of N/10 NaOH in a 10 ml. cylinder

* From the Department of Biochemistry, Dalhousie University, with financial assistance from the National Research Council of Canada.

was added 0.20 ml. of diluted blood and to this was added 2 ml. of pyridine. Standing 30 minutes after mixing was found to be necessary for full colour development; then 5 to 10 mg. of sodium hydrosulphite was added, the solution was diluted to 10 ml. with NaOH and the intensity of the red colour was measured.

As an absolute standard, the pure hæmin was dissolved in N/10 NaOH at a concentration of 65 mg. per 100 ml., equivalent to 0.001 M. Of this stock solution, 0.20 ml. was treated as above. As pointed out by Drabkin and Austin,[11] the absorption spectra of the reduced pyridine hæmochromogens from hæmoglobin and from hæmin are not identical. The difference is, however, so small as to cause a virtually negligible error.

Alkaline hæmatin method.—The procedure of Clegg and King[3] was followed. Of the dilute blood, 0.5 ml. was made up to 10.0 ml. in N/10 NaOH and this was heated 5 minutes in a boiling water bath; the solution was then cooled and read in the colorimeter. As a standard, 0.5 ml. of the stock hæmin solution was diluted to 10 ml. with the NaOH. As pointed out by Clegg and King, the colour intensity of alkaline hæmatin from hæmoglobin is appreciably greater than that derived from pure hæmin. They accordingly added a correction of 30% to the observed colour intensity of the alkaline hæmatin from hæmin.

In order to compare the absorption spectra, solutions of alkaline hæmatin were prepared from human blood and from hæmin, in equivalent concentration (based on iron) of 0.050 mM per litre. The extinctions of the two solutions were measured with four filters in the photoelectric colorimeter, and also with the eight Ilford spectral filters in a visual colorimeter against a gray disc of optical density 0.74.

The results are recorded in Table II and confirm the observation of Clegg and King that the two spectra diverge considerably. Virtually the same ratio as they obtained was observed with the green filter in the visual colorimeter. With the photoelectric colorimeter, however, the ratio in the green was only 1.22; this value was obtained repeatedly with both human and dog's blood. (Dr. King's hæmin gave ratios of 1.21 and 1.34 in the photoelectric and visual colorimeters respectively.) It must further be noted that the absorption spectrum of alkaline hæmatin changes rapidly, even when the solution is kept in the dark. The extinction in the green remained constant, but the absorption in the blue and red increased markedly.

TABLE II.

LIGHT ABSORPTION OF ALKALINE HÆMATIN SOLUTIONS

Filter	*Extinction*		*Ratio, Hb./ hæmin*
	Hb.	*Hæmin*	
Photoelectric, (0.05 mM)			
Blue, B420	0.758	0.513	1.48
Green, B530	0.362	0.296	1.22
Yellow, B590	0.294	0.250	1.17
Red, B660	0.128	0.090	1.42
Visual, (0.10 mM)			
Violet, 450 mμ	1.16	0.62	1.87
Blue, 470 mμ	0.84	0.52	1.62
Blue-green, 490 mμ	0.70	0.51	1.37
Green, 520 mμ	0.60	0.44	1.36
Yellow-green, 550 mμ	0.51	0.34	1.50
Yellow, 575 mμ	0.48	0.32	1.50

It is clear that this method is not suitable for absolute standardization of hæmoglobin determinations, since the ratio, and therefore the correction factor, will depend upon the spectral characteristics of the light source, the filter, and the photocell or other detecting device.

Routine determinations.—Both the iron and the pyridine method are too complicated for routine hæmoglobin determinations. Clegg and King's alkaline hæmatin method was found to give consistent results, if standardized by an absolute method, but the brown colour is not ideal for colorimetric comparison. We have preferred to adopt the cyanmethæmoglobin method, as recommended by Drabkin and Austin,[12] who state: "MHbCN is an ideal pigment for the determination of total concentration".

The procedure is essentially the same as that recently described by Sunderman.[13] Into about 9 ml. of water in a 10 ml. cylinder or volumetric flask is pipetted 0.02 ml. of blood; to this is added 1 drop of 5% potassium ferricyanide and about 1 mg. of solid KCN (estimated on the tip of a spatula). The solution is made up to 10 ml., mixed, and read immediately in the colorimeter with a green filter. The method is simple, rapid, and relatively safe. With a sample of blood of known Hb concentration a calibration curve is constructed. We have found that extinction plotted against concentration deviated slightly from a linear relationship.

Before the photoelectric colorimeter became available, a visual colorimeter was used as a photometer, as described by Sunderman.[13] An Ilford neutral gray disc of optical density 0.74

was placed in the left-hand cup, with an Ilford yellow-green (550 mμ) spectral filter on the eyepiece. Under these conditions blood containing 15 gm. Hb per 100 ml., diluted 1:200, gave a reading of about 1.8 cm., *i.e.*, the extinction (1 cm. depth) was 0.74/1.8 = 0.41.

This cyanmethæmoglobin method, while eminently suitable for routine hæmoglobin determinations, does not, of course, give absolute values unless a spectrophotometer be available for measuring absolute extinction coefficients. (On a previous occasion an opportunity to use a Coleman Universal Spectrophotometer to measure the extinction coefficient of MHbCN at 540 mμ gave results for Hb concentration which were about 10% too low, compared with iron values. This was presumably due to the fact that the 35 mμ band of the instrument is broader than the peak of the absorption band of MHbCN.)

For calibration of the MHbCN method, the hæmoglobin content of several samples of human and dog blood was determined by total iron and by the pyridine hæmochromogen method, as described above and illustrated in Table I. The average values from these two methods were used to obtain the calibration factor for MHbCN. For example, the sample of human blood in Table I was taken to have a hæmoglobin concentration of 16.5 gm. per 100 ml. The MHbCN factor (Hb conc. ÷ extinction) was found to be 62.7. For the dog blood, 16.8 gm. Hb per 100 ml., the factor was 62.0.

DISCUSSION

The experiments described have involved four methods of determining blood hæmoglobin concentration: total iron, pyridine hæmochromogen, alkaline hæmatin, and cyanmethæmoglobin. The iron method gives absolute values for Hb (assuming a negligible amount of non-Hb iron). The pyridine hæmochromogen method also gives absolute values, when calibrated against pure hæmin as a standard. These two methods gave results agreeing within 1%, values which can therefore be assumed to be essentially correct. The procedures are, unfortunately, too involved for routine Hb determinations; but they appear to be very suitable for accurate standardization.

Both the alkaline hæmatin and the cyanmethæmoglobin method are useful for routine determination of total pigment. The latter method is preferred for simplicity and rapidity, greater intensity and stability of the colour. Absolute standardization of these procedures may be accomplished through either the iron or the pyridine method, as described above.

The method of Clegg and King for standardizing alkaline hæmatin against pure hæmin was found to be unreliable since the absorption spectra of the alkaline hæmatins from Hb and from hæmin diverge so markedly. No constant correction factor, applicable in all laboratories, can be used for the hæmin values, because the correction ratio depends upon the spectral distribution of the light used in the colorimetric measurement.

SUMMARY

1. The cyanmethæmoglobin method was employed for routine determination of blood hæmoglobin concentration (total pigment).

2. The method was calibrated, using both human and dog blood, by determination of total iron, and by the pyridine hæmochromogen method against pure hæmin. The two methods gave results agreeing within 1%.

3. The alkaline hæmatin method was found unsuitable for the determination of absolute hæmoglobin concentration, since pure hæmin gave an absorption spectrum markedly different from that obtained with blood.

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It is stated officially that a remedy for seasickness has been worked out in Canada as the result of work carried out by the late Sir Frederick Banting, Surgeon Captain C. H. Best, Royal Canadian Navy, and Dr. Wilder Penfield, Montreal Neurological Institute. The remedy, which has experimentally prevented seasickness in about 75% of persons normally susceptible to it, is given in capsule form.—*J. Roy. Inst. Pub. Health & Hyg.*, 1943, **6**: 303.

THE EFFECT OF MERCURY-INDIGO-DISULPHONATE ON LIVER CANCER OF RATS

By J. E. Davis, M.D.

Chicago, Ill.

IN a previous article[1] it was shown that mercury-indigo-disulphonate was more effective in breast cancer of mice when injected into the cancer than when administered orally. It was suggested that oral administration might be more effective in internal organs such as the liver and kidneys, since they finally take up most of the administered mercury[2] and might be expected to do likewise with the mercury-indigo-sulphonates. The purpose of this study was to determine the effect of oral administration of mercury-indigo-disulphonate on hepatic cancer of rats.

Liver cancer was produced experimentally[3, 4] in the rats by dimethylaminoazobenzene added to a riboflavin-deficient diet of unpolished rice supplemented with carrots. Two series were studied, one in which treatment began on the first appearance of the cysts and nodules that marked the beginning of the gross morphological changes that finally resulted in hepatic cirrhosis and cancer, the other in which treatment was tried both for prevention and cure when a more advanced cirrhotic and cancerous state was allowed to develop. The livers were exposed by laparotomy for gross examination, when excisions were also made for corroborative microscopic examination.

The first series consisted of 16 male and 18 female black and white rats from 4 litters born and raised together for 4 months. After 4 months on the carcinogenic diet their livers were examined, and no nodules were observed. On re-examination 6 weeks later the livers of all showed the characteristic nodules. For experimental and control purposes the rats were then paired on the basis of similar nodular states into 2 groups of 8 males each, and 2 of 9 females each. The 4 groups then had their carcinogenic diet replaced with whole wheat bread supplemented with lettuce and cabbage regularly, and with milk and eggs, occasionally, In addition the experimental group received semi-weekly doses of about 3 c.c. of a 2 mgm. % solution of mercury-indigo-disulphonate in 36 thousandths normal sulphuric acid.* These doses were administered orally under anæsthesia by means of a hypodermic syringe connected to a tube passing down the throat into the stomach. The treated group was still surviving when all the controls had died with the liver and adjacent tissues adhered into one large cancerous mass. Treatment was discontinued after about 25 doses when the females were bred and bore litters. About 3 months after discontinuance of treatment all were sacrificed and their livers showed no observable signs of cancer.

The second series consisted of 20 male and 18 female black and white rats from 5 litters born and raised together for 5 months. The males were divided into 2 groups of 10 each, and the females into 2 groups of 9 each. When these 4 groups were placed on the carcinogenic diet, one group of males and one of females were given the same dosage weekly as the first series later received semi-weekly. That this treatment did not prevent cancer developing under these conditions was shown by the death of one of the treated females with a cancerous liver after only 3 months on the carcinogenic diet, and by the appearance of the characteristic nodules in some of the other livers when examined at that time. A second examination 2 months later showed livers usually with one lobe full of nodules and beginning to adhere to adjacent tissues. The males took about 2 months longer to reach this condition than the females, but, like the females, reached it in spite of the advance treatment.

As soon as this series reached this considerably more advanced state of hepatic cirrhosis and cancer than that of the preceding series, they were changed to the non-carcinogenic diet, and given the dosage semi-weekly instead of weekly. Within another 2 months all the controls and about half of the treated rats had died with the liver and all adjacent tissues adhered into one cancerous mass. It took from 1 to 2 months longer for all but 3 of the remaining treated rats to succumb under similar conditions. The 3 exceptions were 2 females and 1 male, the male showing some hardness and enlargement of the liver, the females showing no such outward signs. As in the case of the first series the 2 females were bred and raised litters, during which time

* In a previous paper on this subject (*Canad. M. Ass. J.*, 1943, **48**: 444), this solution was erroneously described as 36 ten-thousandths.

the suspected cancer of the male developed and death ensued. When their litters were about 6 weeks old, the 2 females also began to show the same outward signs of developing cancer, to which they also eventually succumbed.

A comparison of the results of the 2 series of experiments indicates that the better results of the first series probably depended upon treatment being initiated earlier in the development of cancer. However, the 2 longest surviving females of the more cancerous second series were probably on the road to complete recovery had they not been subjected too soon to the increased demands of pregnancy and lactation, which in the Little cancer strain mice seem to be potent predisposing factors. These two were probably better suited with the dosage than the others, who might have done better on increased dosage or on the tetra- instead of the disulphonate of mercury. All, and especially those of the more cancerous second series, must have been adversely affected by the 2 and often 3 laparotomies. It would seem, therefore, that better results might have been obtained if diagnostic methods could have been less severe, and if such diagnosis could have revealed progressive individual changes to which the treatment could have been adapted.

That oral administration proved more effective for liver cancer of rats than for breast cancer of mice may have been due mostly to the part played by the mercury component of the mercury-indigo-disulphonate. If the liver and kidneys are the main depository of this compound as they are of absorbed mercury, then of all the internal organs they would be most likely to be affected by its oral administration.

That this compound was unable to prevent cancer of the liver, but could help toward its cure, can be explained on the basis of the view previously presented,[1, 5] that cancer is basically a malnutrition disease. It would seem that both dimethylaminoazobenzene and riboflavin deficiency worked in this direction, the former by probably making the liver cells less permeable to oxygen and substrate, the latter together with probable nicotinic acid deficiency[4] by weakening links in the oxidation-reduction system within the cell. It would seem that neither effect alone, but only both together, could produce sufficient cellular malnutrition to result in cancer. On the basis of this reasoning it would further seem that in the case of these rats and perhaps in other similar cases, it would be necessary to recognize and remove the causative factors before the condition produced by them could be expected to respond favourably to treatment.

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Case Reports

SPONTANEOUS RETROPERITONEAL HÆMORRHAGE COMPLICATING PREGNANCY

By D. M. Low, M.B., M.R.C.O.G., F.R.C.S.(C)

Toronto

Death from spontaneous hæmorrhage is a not uncommon occurrence, but is usually associated with traumatic injury or essential arterial disease. The case I am reporting is one occurring in a multiparous patient within two weeks of term, in what had been a normal pregnancy and with no previous history of injury or disease. There was a fatal termination. It is difficult to believe that such an accident has not occurred before, but so far I have not been able to find any record of such a case occurring during pregnancy.

Briefly the history is as follows:

This patient was aged 35 with two previous pregnancies, and at the time of admission to hospital was within two weeks of full term. The pregnancy had been normal and she had been doing her usual work until about 11 p.m. of the day prior to admission to hospital when immediately following a bowel movement she was seized with a very violent pain in the left upper quadrant of the abdomen, extending to the back. She collapsed and when seen about one hour later by her physician was in a state of profound shock and remained in that condition on arrival at the General Hospital, about one hour later. On admission, the patient was very pale and semi-conscious, no radial pulse could be detected, and no blood pressure reading could be obtained. On abdominal examination there ap-

peared to be a uterus about the size of 8½ months, movable, and not specially tender. No fetal heart could be heard, and on rectal examination the cervix was not dilated. A small catheter specimen of urine was negative for albumin. There was marked dullness in the left flank and upper quadrant, not extending to the midline, and no signs of shifting dullness.

The patient was given the usual stimulants and intravenous saline, and in about one hour and a half a radial pulse of very poor quality and rate, varying between 120 and 180, could be made out and blood pressure varying between 70 and 90 systolic recorded. Our preoperative diagnosis was spontaneous rupture of the uterus with hæmorrhage. The patient was prepared for laparotomy and 500 c.c. blood, indirect method, given before the anæsthetic was started. Under gas oxygen and ether a left upper incision was made and considerable quantity of free fluid stained with blood, escaped from the peritoneal cavity. The uterus itself was very flabby and pale in colour but there was no sign of hæmorrhage in the wall or of rupture. Both adnexæ were normal. On opening the uterus a dead female child was removed, with rigor mortis already present. The uterine incision was closed with two layers of suture. On exploring the abdomen further a massive retroperitoneal hæmorrhage was seen, extending from about the left brim of the pelvis up behind the sigmoid descending colon and splenic flexure and extending across the midline of the upper abdomen. It had also extended laterally to the region of the spleen and left kidney and seemed to be maximum in this region. There was no free gas in the abdomen and no bowel content.

The patient was in very poor condition and as we were satisfied we were not dealing with any intraperitoneal hæmorrhage, the abdomen was closed. During the operation the blood pressure rose to 110 systolic and the pulse improved in quality and rate, 110 to 120. Following her return to bed, she remained in a state of profound shock for about seven hours but in spite of further blood transfusion, she sank into an unconscious state and died.

A postmortem abdominal examination was made and the operative diagnosis of massive retroperitoneal hæmorrhage corroborated. All the large arteries were relatively thin walled. The left ovarian was particularly thin walled, dilated and tortuous, and presented some aneurysmal dilatations near its origin. There was no evidence of periarteritis nodosa.

Acknowledgment is made to Dr. R. C. Coatsworth, Toronto, for permission to publish this case.

Medical Arts Bldg.

A CASE OF TULARÆMIA OF UNUSUAL ORIGIN

By Irving R. Bell, B.A., M.B., F.R.C.P.(C)

Edmonton, Alta.

A male packing plant worker, aged 36, was first seen at his home on May 23, 1943. He complained of a severe headache which had begun the day before, accompanied by chills and fever, causing him to lay off work. Marked photophobia, a rigid neck, and a positive Kernig sign were present, and he was admitted to the Royal Alexandra Hospital with the presumptive diagnosis of a septic meningitis. A sore was noted on the third finger of his left hand at the edge of the nail. This, he said, had been injured at the plant a few days before and had been dressed by the plant nurse, but had not been bothering him very much, although there was some tenderness up the arm and in the axilla.

On admission to the hospital the white cell count was 22,000 with 90% granulocytes, but the spinal fluid was negative. Heavy doses of sulfadiazine were given and the finger was opened. A culture of this showed a staphylococcus and an unidentified Gram-negative bacillus. The blood culture was negative. Although a sulfadiazine level of 19 mgm. was reached on May 26, no improvement was apparent, except that the meningeal signs had disappeared and the white cells had come down to 7,800. In other respects the patient's condition became worse.

In general the picture was like that of typhoid fever, except that the pulse rate ranged higher. Signs of broncho-pneumonia developed on both sides, and during the next three weeks he was continually delirious and unco-operative and required constant watching to keep him in bed. Much oxygen, transfusion, and parenteral fluids were used. Agglutination reactions were at first negative for the typhoid group, tularensis, and abortus, but a repeat on June 8 showed a positive result for tularensis, 1-1,600, and paratyphoid, B1-100. Fluid developed in the left pleural space and on June 16, 600 c.c. of a sero-

sanguineous fluid were aspirated. A guinea pig inoculated with this became ill on the 22nd, was killed on the 24th and showed the gross lesions of tularæmia in the liver, spleen and glands. Further aspirations of the bloody fluid were made on June 25, and on July 8, and the patient made a gradual good recovery and was discharged on August 14 with some residual stiffness of the left hand and adhesions at the base of the left lung.

The most interesting question about this case is how did this man contact the infection? He was engaged at the packing plant at an operation called "pulling tongues" on hogs. This involves putting the hand into the hog's mouth and throat. He had no contacts with other animals either at the plant or at home. It is well known that the rabbit, small rodents, and many game birds are often infected with the bacillus of tularæmia. Water-borne tularæmia has also been reported by Karpoff and Antonoff, Russian workers, in 1936, and Bow and Brown (*Canad. M. Ass. J.*, 1944, 50: 14) further point to the possibilities in this direction. Sheep have been infected and reported on by the same writers, but this seems to be the first case definitely associated with the handling of hogs.

The following possibilities would seem to arise.

1. The pig's mouth became contaminated by the eating of some infected animal such as the rabbit.

2. The pig had been drinking from an infected water supply.

3. The bacillus of tularæmia is capable of living in a pig's mouth without necessarily infecting the pig.

4. The pig was suffering from local lesions in the mouth or from a generalized infection.

The Departments of Agriculture and of Health are both keenly interested in the matter and intend to follow up and clarify the above problems as far as possible.

620 Tegler Bldg.

DEATHS OF UNITED STATES PHYSICIANS IN 1943.—The Obituaries of 3,156 physicians were published in the *Journal of the American Medical Association* last year; and an analysis shows that the average age at death was 65.2 years. Heart disease continued to lead the causes of death among physicians.

Special Article

INTRA-ORAL AND LARYNGEAL CARCINOMA

A Round Table Discussion* (in part only)

By the Directors of the Ontario Cancer Centres

NORMAN A. MCCORMICK, M.D.
of Windsor, Chairman

A. H. SELLERS, Squadron Leader, R.C.A.F., Medical Branch, of the Ontario Department of Health: During the period 1934 to 1939 inclusive a total of 464 cases of intra-oral cancer (tongue, buccal mucosa, alveolus, and floor of the mouth) were accepted for treatment at the Ontario Cancer Centres. In addition, there were 74 cases of carcinoma of the larynx. This represents 5.8% of all new cancer cases treated at these Centres during the period; 85% of cases are in males. The male preponderance appears to be most marked after the age 60. One-third are in the age group 60 to 69 years and one-third are 70 years of age or over. Only 2% of cases present at ages under 40 years and only 10% at ages under 50. Of female cases, almost one-half occur in the age group under 50 years.

The cases were distributed by stage of disease as set out in Table I.

TABLE I.

STAGE OF DISEASE—INTRA-ORAL CANCER

Site	*Percentage of cases of stage*				*Total cases (net)*
	I	*II*	*III*	*IV*	
Tongue.....	29	40	23	8	142
Buccal mucosa.	26	51	19	4	103
Alveolus.....	17	43	30	10	84
Floor of mouth.	18	52	26	4	44
Larynx.....	24	45	28	3	69

The basis of the staging of cancer of the tongue adopted for the purpose of the study was as follows:

Stage I.—Early—Primary lesion limited to one-half of tongue, less than 3 cm. in diameter; no glandular involvement.

Stage II. — Moderately advanced — Primary lesion 3 cm. in diameter or greater, with infiltration of the tissues of one-half of the tongue, and/or discrete minor unilateral glandular involvement.

Stage III.—Far advanced—Primary lesion far advanced, with infiltration of tissues of both halves, and/or massive unilateral glandular involvement and/or minor bony involvement.

* Held at the seventh annual mid-winter session of the Eastern Division of the Canadian Association of Radiologists, Hamilton, Ont., January 4, 1943.

Stage IV. — Very far advanced — Primary lesion far advanced, massive bilateral glandular involvement, and/or extensive bony involvement.

The remaining intra-oral and laryngeal groups were classified according to stage of disease by essentially similar criteria.

RESULTS OF TREATMENT

In preparing the statistical data all cases of oral cancer presenting themselves at the clinics were covered. Excluded from the analysis, however, were recurrent cases, cases refusing treatment or in which the clinical and histological diagnoses were in disagreement, and cases in which the stage of the disease was not stated.

The results of treatment, expressed in terms of net survival rates, are set out in Table II.

TABLE II.

RESULTS OF TREATMENT—INTRA-ORAL CANCER
ONTARIO CANCER CENTRES—1934 TO 1939

Site of cancer	*Cases studied*	**Net cases*	*Three year net survival rate (%)*				
			Stage I	*Stage II*	*Stage III*	*Stage IV*	*All stages*
Tongue	174	142	78	52	17	17	47
Buccal mucosa	130	103	82	49	16	0	50
Alveolus	106	84	67	60	21	18	44
Floor of mouth	54	44	70	55	23	0	48
Larynx	74	69	60	24	16	0	29
Total	538	442	..	..	..	..	..

*Excluding deaths from causes other than cancer and patients lost sight of.

CANCER OF THE TONGUE

DR. SELLERS: The three-year net survival rate in cases of cancer of the *tongue* was 78% for early cases (Stage I), 60% for Stages I and II combined, and 47% for all stages combined. In other words, three years after treatment was begun, 67 patients' or 47% of the net cases (as defined), were still alive. Dividing cases of cancer of the tongue into two groups—with and without involvement of glands at the time treatment was begun—the three year survival rates were 69% in cases without glands; and 26% in those with glands.

TREATMENT OF THE PRIMARY GROWTH

DR. A. E. WALKEY, Hamilton: Our treatment depends considerably on the location, and size of the lesion. If the growth is on the anterior two-thirds of the dorsum, or side of the tongue, and is not larger than 1.5 cm. in diameter, radium needles are chosen. The needles contain 1 or sometimes 2 mgm. of radium element, filtered by a platinum wall 0.6 mm. thick. They are implanted around the margin of the lesion and spaced about 1 cm. apart, with a second row half way between the first a half a centimetre further out. The needles are left in place for 6 to 7 days.

All other cases of primary carcinoma of the tongue are given a thorough course of external 200 k.v. x-radiation, at 50 cm. distance, using 0.5 mm. of copper and 1.0 mm. of aluminium filtration and through as many ports as can be arranged on both sides, including the submaxillary region. From 200 r to 300 r is given to each field two or three times a week until a fairly good skin reaction is present. By this time the lesion will have markedly receded. Following the x-radiation radium needles are implanted for one-third or a half of that dose used when no x-radiation is given.

If the lesion is on the base or posterior third of the tongue, radon seeds are usually implanted after the x-radiation instead of needles, as it is very difficult in this location to place and retain the needles in correct position.

DR. PAUL BRODEUR, Ottawa: We have followed the technique of the Radium Institute of Paris in the treatment of cancer of the tongue and divided them according to the localization of the primary lesion, into three groups: (*a*) *Dorso-lingual anterior*—cancers situated on the anterior two-thirds of the dorsum of the tongue, between the tip, the lateral borders and the V-shaped line of the papillæ. (*b*) *Dorso-lingual posterior*—cancers situated on the dorsum of the tongue or on one of its lateral borders, but posteriorly to the vallate papillæ with a tendency to extend downwards in the direction of the epiglottis. (*c*) *Infra-lingual* — cancers which develop under the tongue, whether in the tongue itself or at the junction of the tongue and the floor of the mouth, or directly in the floor of the mouth.

Categories (*a*) and (*c*) were treated by radium implantation of needles, each containing one or two milligrams of radium element with a filtration equivalent to 0.6 mm. of platinum. The needles were implanted in the tongue at 1 cm. distance from one another and they remained in place for a period of at least 120 consecutive hours. The dose given varied between 0.5 to 1 millicurie destroyed per cubic cm. of irradiated tissue. In a few instances in category (*a*), when the primary lesion was large and of the fungating type the projecting portion

of the tumour was removed by the electric knife and this operation was immediately followed by radium implantation of needles into the bed of the tumour. A number of cases in category (*c*) which were confined to the floor of the mouth were treated by radium surface application with a moulded apparatus placed intra-orally, and this treatment was afterwards completed by external roentgen therapy. Category (*b*) cases were treated by roentgen therapy externally through a number of portals with the x-ray beam directed towards the tumour and with a total dose varying between 6,000 and 8,000 r, measured in air.

DR. G. E. RICHARDS, Toronto: In early cases such as would be classified as Stage I there is a choice between radium applied interstitially as the sole method of treatment or the protracted use of external radiation. However, in spite of the fact that some excellent results may be obtained by interstitial radium we have reached the conclusion that the better plan is to treat even these early cases by the method of external irradiation, reserving radium for the final phase of treatment in refractory cases.

For all cases except the few in the previous group our plan of treatment includes intensive irradiation by means of external fractional doses of x-rays at 400 k.v. or teleradium therapy combined with intra-oral irradiation by x-rays at 200 k.v. These treatments are continued until a satisfactory reaction develops. The criterion of dosage is the total disappearance of the tumour or a tissue reaction which is, as nearly as can be estimated, as much as the tissues or the patient may safely tolerate. This is obviously an individual problem differing in each case.

If the malignant mass totally disappears, leaving the tissues soft and pliant no further steps are necessary. If, in spite of adequate reactions residual disease is still present, radium is administered as an interstitial application. For this purpose we prefer radium-element needles containing 2 mgm. and having a filtration of 0.5 mm. platinum. The needles are spaced at 1 cm. centres and left in place 72 to 96 hours.

IMPORTANCE OF ORAL HYGIENE AND ADEQUATE SUPPORTIVE MEASURES

Bloodgood used to teach that: "cancer never occurs in a clean mouth" and, while there are many exceptions to this aphorism, it is a fact that most persons presenting themselves for the treatment of intra-oral cancer urgently require the most careful oral hygiene both before treatment is undertaken and during the period of reaction. The following steps are important:

Removal of septic teeth.—All septic or doubtful teeth or old tooth roots should be removed *before* any treatment is undertaken. In any advanced intra-oral cancer requiring long and intensive treatment it is a good precaution *deliberately* to remove all remaining teeth even though some may be perfectly healthy at the time. This is done for the reason that should extractions become necessary some months or even years after heavy radiation has been given healing will be slow, "dry" sockets frequent and occasional cases of osteomyelitis are bound to be encountered. Most of these troublesome complications may be avoided by meticulous care prior to the beginning of treatment.

Cleansing.—Simple mechanical cleansing by means of suction and power sprays is more effective than antiseptic solutions alone and for this purpose saline or 5% solution of soda bicarbonate is frequently quite sufficient. Various mild antiseptics may, of course, be employed, the choice including Dobell's solution or one of the hypochlorite preparations in weak solution. Regardless of the preparation employed thorough *mechanical* cleansing is the essential part of the procedure and this the patient can seldom do for himself nor can the result be achieved by the use of the average mouth wash as commonly employed. During the period of reaction and for some time after it has subsided the mouth is finally sprayed gently but thoroughly with warm paraffin oil, several times each day.

Nutrition.—Nutrition is maintained by forcing fluid foods, making use if necessary of the intra-nasal feeding tube. Total caloric intake may be kept as high as 3,200 calories per day by this means and this is extremely important. No benefit seems to have been derived from large intake of egg-white and this type of diet has been discontinued.

Medication.—This includes: (*a*) Sedatives as indicated for relief of pain. These may be local in the form of aspirin mouth or throat irrigations, orthoform powder as a spray, etc., or such drugs by mouth as may be necessary to relieve pain and ensure sleep. Far more harm to the patient will result from loss of sleep and constant pain than from any medication necessary to control both.

(*b*) It is our custom to prescribe small doses of potassium iodide routinely in all oral cases and in addition iron, calcium lactate, and vitamins in adequate doses (thiamin chloride, riboflavine, nicotinic acid and ascorbic acid).

(*c*) If the hæmoglobin is 50% or lower blood transfusions are indicated in such quantity as may be required to bring the hæmoglobin up to 75% and such transfusions should be repeated as often as may be necessary to maintain the blood at this level.

THE COMPLICATIONS OF TREATMENT
THEIR AVOIDANCE AND CARE

DR. IVAN H. SMITH, London: Faced with an intra-oral cancer one categorizes it immediately as either curable, suitable for palliation, or hopeless. Palliative irradiation therapy aims only at retarding tumour growth and should never en-

croach on lethal tissue dosage. The curable tumour offers the supreme challenge. This is the tumour which demands that a lethal tumour dosage be delivered with a homogeneity which permits complete repair of all irradiated tissues. To achieve this, one must be familiar with a choice of procedures, and elect to use the technique best adapted to the individual lesion. Two observations within recent years stand out as basic principles in estimating lethal tumour dosage. The first is the 6,500 "r", (radium, Paterson and Parker) dosage delivered by radium implant or mould over a five to seven day period. Checking distribution of implanted needles by radiograph enables one to rearrange needles, or time, or even build up a low point with seeds so as to give the required dose. The second is that 6,500 roentgen units will destroy a growth of reasonable sensitivity if delivered over a five to seven week period by fractionated daily doses, through multiple ports as required, using the fairly standard 200 k.v. equipment. This is a broad general yardstick; still it is a good elementary gauge.

In appraisal, therefore, of prime preventive factors in radio-necrosis I would top the list (1) with the selection of that technique best suited to the case, taking well balanced cognizance of such particulars as stage, grade, and site; (2) the strict application of well founded principles of radium and roentgen ray lethal tumour dosage; (3) the observance of rules reducing oral sepsis and irritation such as the extraction of pyorrhœic teeth, dental snags, the use of mouth irrigations, and the elimination of smoking, chewing, etc.; (4) the general systemic condition must be maintained by a properly balanced diet, not forgetting the anæmias; remembering that the basic etiological relationship in 75% of oral cancer in women, is the Plummer-Vinson syndrome, with its microcytic anæmia, which must be controlled indefinitely by appropriate measures. Having attended to each of these items, necrosis will be reduced to a minimum. It will not be absolutely eliminated. Let all critics be reminded of two human frailties: first, the shallow barrier of tissue overlying mandible and maxilla; and, secondly, the potentially pathogenic bacterial flora within the oral cavity. If, therefore, mucosa overlying bone is invaded and deletion of tumour is to be attained, necrosis of bone will often be an inevitable sequel, not a shameful coincidence. Better in such cases accept a high dose with necrosis and cure, than a low speculative dose with dormant neoplasia and ultimate defeat.

DR. G. E. RICHARDS: Most of the complications which are directly attributable to the treatment have in the past been due to (1) the effects of radium upon adjacent bony structures resulting in "radio-necrosis" of bone or (2) necrosis of soft tissues due to overdoses in local areas. Both of these complications have been greatly reduced since the adoption of the external method of treatment. We therefore no longer use dental moulds, moulages or special applicators as our experience has been that these are far less satisfactory procedures and carry more risk. If, however, necrosis of bone occurs, as inevitably will happen in a small percentage of cases, sufficient time is allowed to permit the sequestrum to separate of its own accord and until a line of demarcation forms so that the sequestrum may be lifted out easily. If there is no indication that such separation is taking place radical surgical excision is carried out. In the mandible this may be a very simple procedure or may require resection of a portion of the mandible or even a hemisection. Our surgical staff have reached the conclusion that this procedure is actually less serious than a neck dissection, carries less operative risk and is attended by surprisingly slight disfigurement. If there is much involvement of the superior alveolus radical surgical removal is also the treatment of choice although this is a more difficult operative procedure and the resultant defect is difficult to deal with, requiring as it does a special denture.

TREATMENT OF THE NECK IN STAGE I CASES (THE PALPABLY UNINVOLVED NECK)

DR. BRODEUR: As a prophylactic measure we usually irradiate by deep x-ray therapy the side of the neck nearest the primary lesion. A minimum dose of 1,800 r, measured in air, is administered externally to the submaxillary and cervical regions. The x-ray treatments are started about three weeks after the radium needles have been removed, *i.e.*, towards the end of the radio-epithelite reaction. I am well aware that numerous American authors, and in particular Max Cutler and James J. Duffy, are not in favour of prophylactic irradiation of the neck, but we feel justified in doing it on account of the frequency with which glandular involvement appears a few months after treatment of the primary lesion. Postponing treatment of the neck until such time as nodes have manifestly developed is particularly hazardous, in view of the fact that patients very often do not return to the Cancer Clinic at regular intervals, but are prone to wait until massive involvement has taken place. This prophylactic roentgen therapy, moreover, serves as a complement to the radio-therapeutic treatment of the primary lesion.

TREATMENT OF METASTATIC LYMPH NODES OF THE NECK

DR. WALKEY: If early and freely movable glands are present when the patient is first seen, thorough x-radiation should be given to both the gland area and the primary. Subsequently the primary is treated with radium needles and when it is well under control small single nodes may be carefully excised and radon seeds im-

planted, or a block dissection of the gland-bearing area of the neck performed. Certain rules elaborated by Quick, should be strictly observed, and neck dissection done only when the following indications are all present: (1) the primary lesion is controlled; (2) the primary lesion is limited to only one side of the oral cavity and (3) is of a histological Grade I or II malignancy; (4) metastases are present on one side only, and in one or at the most two, contiguous groups; (5) the glands are not fixed and no distant metastases are present; (6) the patient is in good general condition.

IMPORTANCE OF BIOPSY AND TUMOUR GRADING AND THE PLACE OF BLOCK DISSECTION OF THE NECK

DR. SMITH: Probably the reason I attach so much importance to the grade of a tumour is a reactionary one: reactionary because of the indifference manifest only too often by radiotherapist and surgeon alike to its place in the management of many malignant growths.

Based on percentage differentiation of tumour cell along with other cytological features and histological characteristics, grades 1, 2, 3, and 4 as conceived by Broders, are acceptable categories. Sometimes one wonders if three grades, namely, low, intermediate and high, would tax the ingenuity of the pathologist less and still be sufficiently informative to the clinician. Some tumours like basal cell carcinoma and lymphosarcoma are intrinsically radio-sensitive. Some are intrinsically radio-resistant. Some tumours defy classification even by the most imaginative pathologist. But not so for the squamous cell epithelioma which lends itself so favourably to microscopic grading. The rule of a regional lymph node is to assume the histological prototype of its primary. This is not absolute, yet is sufficiently basic to be used in postulating the histology of metastatic disease. The grade 1 cancer is so low in quality that it expends little energy in growth, but much in function, namely, in the production of keratin. It is slow to metastasize; it is radio-resistant. But its radio-resistance is only relative, depending on accessibility, and tissue host. There is a vast difference in normal tissue tolerance to irradiation. The oral mucosa will withstand an implant which will destroy the lowest grade epithelioma, but a similar tumour in the thoracic œsophagus presents an entirely different outlook. So does the grade 1 regional cervical node; its depth, resistance and tissue bed combine to defy its annihilation by external radiation alone without overlying tissue damage.

Admitting these premises, what then is the practical application to the lymph node metastases of intra-oral carcinoma? (1) Never a prophylactic block dissection unless in a young person with a low grade cancer, where the size and duration of the primary militate against the improbability of early node involvement; (2) never any surgical interference in the high grade metastases; (3) a regional block dissection plus radium, occasionally seed, implant for the solitary low grade node; (4) a complete radical block, after Crile, for low grade multiple nodes, involved yet technically operable; await results and for recurrence, heavy external irradiation plus a central dosage build up by seeds; (5) prophylactic x-radiation only and always to the uninvolved neck with an anaplastic primary; (6) x-ray therapy to the high grade involved nodes, with seeds as an adjunct if the regression is incomplete. There is aid also to be gained from grading the malignancy of an advanced cervical mass suited only for palliation. While this may all seem confusing, the marked variations in gross and microscopic tumour morphology must be paralleled by a versatility in treatment technique.

DR. BRODEUR: It is needless to add that in cases of massive unilateral glandular or minor bony involvement (Stage III) and in the very advanced Stage IV cases, no block dissection of the neck should be attempted and that the recommended treatment is external roentgen therapy.

BONE INVOLVEMENT

DR. WALKEY: If the primary growth has invaded the bone a cure cannot be expected by irradiation alone. If the soft tissue tumour has been placed under control it is advisable, in cases of minor involvement, to resect the mandible as soon as the x-radiation reaction has subsided. Cancerous involvement of the bone appearing some time after treatment of the primary growth may be very difficult to distinguish from a post-radiation necrosis. If the primary has entirely healed the disease of bone is most likely due to the radiation, and in this case it should be left completely alone until the sequestrum has formed and separated off. No radical surgery should be attempted. Dr. Richards has already spoken of the treatment of this radio-necrosis of bone.

CANCER OF THE BUCCAL MUCOSA, ALVEOLUS AND FLOOR OF MOUTH

DR. SELLARS: The three year net survival rate for all stages of cancer of the *buccal mucosa* was 50%. Of 103 net cases (deaths from causes other than cancer excluded) 51 were alive three years after treatment. For Stage I cases the survival rate was 82% and for Stages I and II the survival rate was 60%.

The over-all net survival rate for cancer of the *alveolus* was 44%, 37 of the 84 net cases being alive three years after treatment. The rate for Stage I cases was 67% and the rate for Stage II cases 60%.

In a small group of cancer of the *floor of the mouth*, the net three-year survival rate of Stage I cases was 70%. Almost one-half (48%) of

these patients were alive three years after treatment was begun.

DR. MCCORMICK: The problems involved in treating all these intra-oral tumours are essentially those of the treatment of cancer of the tongue and its metastases, and the foregoing remarks apply equally as well to the growths of these other areas. I feel strongly that an intensive course of fractionated heavily filtered x-radiation should always be used to initiate treatment in the entire group of intra-oral tumours and supplemented by interstitial implantation whenever one is dealing with the more radio-resistant and histologically differentiated growths. A great deal of pain may at times be avoided by performing a partial or hemi-glossectomy with the endotherm knife, a few days after the radon or radium element implantation, and following the preliminary course of fractionated external roentgen irradiation.

The importance of the local and systemic care that these patients require cannot be overemphasized. The management of the neck is an exacting problem which necessitates a very close correlation between external roentgen irradiation, interstitial radium or radon implantation and surgical dissection. Certain very definite rules apply to these procedures and these have been well outlined in the course of this discussion.

CANCER OF THE LARYNX

The combined experience of the Centres with 69 treated cases provides a 29% net three year survival rate. This figure really affords very little aid in endeavouring to estimate the prognosis of an individual patient, however, because this group of 69 patients is composed of two very different anatomical and histological entities. Cancers arising from the vocal cords, the ventricles or the ventricular folds are usually spoken of as growths of the *intrinsic larynx*. Those which originate from the arytenoids, the post-cricoid region, the aryepiglottic folds or the epiglottis are cancers of the *extrinsic larynx*. A very careful distinction must be made between these growths because they differ markedly in clinical course, amenability to treatment and in ultimate prognosis.

Histologically, cancer of the intrinsic larynx is almost always a well differentiated adult type of squamous cell carcinoma of grades I or II. These growths are highly radio-resistant and rarely metastasize. Cancers of the extrinsic larynx are usually totally anaplastic growths of the lympho-epithelioma or transitional cell types. These tumours are radio-sensitive, highly malignant and tend to metastasize early and extensively. An occasional squamous cell carcinoma is encountered amongst the extrinsic growths but these also are of the higher grades of malignancy and rarely show pearl formation.

TREATMENT

(*a*) *Intrinsic growths* as stated rarely metastasize and if properly treated offer a not unfavourable prospect of cure. If unsuccessfully treated they slowly progress and cause death by local extension. *Total laryngectomy* cures the early case. Those of you who have seen this operation, however, will agree that it is a very mutilating and radical procedure and I do not believe I will arouse any controversy by stating that it should be discarded. I have no particular fault to find with those who advocate *partial laryngectomy* (hemilaryngectomy, laryngofissure, thyrotomy or etc.) in the treatment of these early cases. Satisfactory survival rates are thus obtained but only with substantial impairment of voice. In accordance with the teaching of Quick we do not perform this operation in our Clinic on the early and favourable case but reserve it for certain complications of which I shall speak.

Roentgen rays are, we believe, the method of choice in the previously untreated and preferably early case of cancer of the intrinsic larynx. The type of case especially suited to laryngofissure is particularly amenable to external roentgen irradiation and the result is a complete restoration of function. The treatment must be conducted with meticulous attention to detail, and there must be very careful elimination of all technical errors. Heavily filtered (2.5 Cu.) 200 k.v. roentgen therapy is used daily through three 4 x 5 cm. portals and a total dose of from 7,500 to 12,000 r, measured in air, is given over a period of about 60 days. The patient must be kept under careful clinical observation and given adequate supportive measures. The dose of 12,000 r is never exceeded and should there still be growth present when this limit has been reached, or if for any reason the patient has not been doing well, we invariably discontinue this treatment and substitute surgical measures.

Infection following upon an acute cold some weeks after the termination of apparently successful roentgen treatment is an occasional unfortunate and serious complication. Such a mishap, if allowed to progress, leads to a necrosis of cartilage and is very prone to prove uncontrollably fatal. Prompt laryngofissure and adequate drainage may yet salvage the case. Roentgen irradiation is not indicated in the treatment of the larynx already damaged by incomplete or inadequate irradiation, or in the recurrent case, or in the advanced case in imminent danger of obstruction and requiring tracheotomy. If roentgen irradiation is used in such cases it is only as a preliminary to laryngofissure and radon or electrosurgical removal.

Radium is not used in the early cases of intrinsic cancer of the larynx but as mentioned above, and as pointed out by Quick, this agent may be very useful along with laryngofissure in

the very advanced case or in the presence of complications following roentgen irradiation.

(*b*) Primary *extrinsic growths* are completely unsuited to surgical procedures. Fractionated x-ray therapy is the treatment of choice. Conservative surgical exposure with radon implantation has certain definite indications in the case of metastatic nodes which have not completely regressed under the roentgen therapy. Satisfactory results are thus obtained in those cases which do not subsequently develop widespread metastases.

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Clinical and Laboratory Notes

REPORT ON THE CLINICAL USE OF BONE MEAL

By Elizabeth M. Martin, M.D.

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Because of the recent popular and professional interest in bone meal as a therapeutic agent we have considered that the records of our past four years' experience with it may be of interest and value to the profession.

The case for which this agent was first used extensively was that of the six-year old son of one of our nurses. The child had a cleft palate and hare lip, both of which had been repaired before the age of two years. There was, however, a grave defect in his dentition, his primary teeth being very poor and having almost no covering enamel. He had gained only two pounds in the previous year. In consultation with our dentist, Dr. Wm. J. Siebert, we decided to have these poor upper teeth removed. There was considerable question as to how sound the secondary teeth would be, but it was felt this would give them a better chance.

There were no other physical defects in the child, excepting his undernutrition. He complained bitterly of pains in his legs; the so-called "growing pains" of children. He was given a brand of dicalcium phosphate with vitamin D in 10-grain doses twice a day with some improvement in his symptoms but no weight gain and he had much restlessness with night terrors. His mother noticed that the little chamber he used at night was becoming encrusted with calcium deposit. We supposed from this that he was getting very little absorption of the calcium which he took.

It occurred to us that if we gave bone-meal to calves and young pigs and puppies to promote proper growth, why should not nature's own combination of bone minerals be completely utilized by any animal body? Accordingly, we sifted and pulverized the available bone meal and filled 10-grain capsules by hand. In one week the child was playing as hard as any of his schoolmates. There was no more excess calcium deposit, although he was getting three 10-grain capsules daily. He began to grow and gain weight, until he caught up to the normal average for his age. His teeth were very slow to appear, it being about a year before his central incisors came through, but they were sound when they did arrive. He then made steady progress in the three years in which we had him under observation.

The results in this case were so striking and so immediate that we decided to run a series of cases. Any child complaining of "growing pains" or whose parents stated that he or she kicked and screamed in the night was put on calcium gr. xx daily, and alternate patients, on bone meal capsules gr. xx daily, with the minimum requirement of A and D as a supplement in each case. Records kept over a two-year period on 112 children showed complete remission of symptoms in all children on bone meal (57) and of 22 on dicalcium phosphate; with some complaints still, though not so marked, in the remaining 34 children. Just as a matter of curiosity these 34 were changed to bone meal and in all cases the symptoms disappeared.

We also had a small group of pregnant women who were very much interested in preserving their teeth during pregnancy, and in some cases the multiparæ dreaded the dental neuralgia they had had to endure during previous pregnancies. All of these women agreed to have their teeth checked and all cavities repaired at three months' gestation, with a final check-up at the 6 weeks' examination. Dr. Wm. J. Siebert, our dentist, kindly did all the dental work and kept dental charts for us. Twenty-five women were given 10-grain bone-meal capsules three times a day (two of the women who would have been on dicalcium phosphate, thought it gave them heartburn, so they were changed over in the first week) and 20 women were given 15 grain dicalcium phosphate wafers twice daily during the last six months of pregnancy and the first six weeks of lactation. None of the women had dental neuralgia. Those who had suffered from this previously had never had supplementary medication during their former pregnancies. Each one of these women also received A and D; 7,500 units "A" and 750 "D" daily to ensure proper mineral metabolism. None of the women had aching legs or cramps in the legs at night nor cramps in the legs on delivery. All of the babies were healthy at birth, but those whose mothers had been given bone meal had such long silky hair and such long nails that the phenomenon was remarked upon by the nurses.

At the six weeks' examination all of the babies were doing very well and the mothers were healthy. About one-quarter of the babies were

still breastfed. The dental check-up revealed that not one woman on bone meal had a new dental cavity and the cavities for the other women averaged one and two-tenths per patient. The dentist stated that even this was well below the expected number following an unprotected pregnancy.

We use bone meal in place of any other form of calcium for all evidences of calcium deficiency in our patients, including muscular pains and cramps in the legs in both sedentary workers and labourers. The condition exists very widely because of the habit of most Canadians in ingesting a diet very low in calcium. All of these symptoms clear up promptly on 10 to 15 grains of bone meal daily. This is now supplied to us in a soft gelatin capsule containing finely pulverized meal from selected bones, combined with sufficient A and D to ensure absorption.*

If vitamin D is to be effective as an aid to calcium metabolism, the calcium ingested must be at least the minimum requirement[1] and must be available for absorption. The availability appears to be greatly enhanced by using natural bone minerals without trying to make any alteration in nature's formula.

REFERENCE

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67 King St. East.

EXAMINATION REQUIREMENTS FOR LABORATORY TECHNICIANS

By Harvey Agnew, M.D.

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Until July 1, 1945, the Canadian Society of Laboratory Technologists will admit to the examinations for general membership candidates who have adequate educational requirements but who have not graduated from approved schools for laboratory technicians. After that date only graduates of approved schools may be admitted to the C.S.L.T. examinations for general membership.

This agreement was reached at a meeting on February 9 of officers of the C.S.L.T. with the Committee on Approval of Schools for Laboratory Technicians of the Canadian Medical Association. The arrangement was agreed upon to permit technicians who have had excellent training but have not graduated from the more recently organized approved schools to take out membership in the society.

SPECIALTY CERTIFICATES

A somewhat similar arrangement was made with respect to those men and women doing highly specialized laboratory work and who would be desirous of holding a specialty certificate. It is quite possible in the next few years, particularly if health insurance is introduced, that all laboratories may be required to employ only technicians who have taken approved courses of training or hold certificates of membership in a recognized technicians' society. In view of this fact it has seemed desirable to waive temporarily the present requirement of the C.S.L.T. for preliminary general training and permit technicians practising specialties to take their examinations in their respective fields.

Accordingly it has been arranged that up to July 1, 1945, technicians engaged in special fields in medical laboratory work *as of January 1, 1944*, may be admitted to the Canadian Society of Laboratory Technologists upon examination in their specialties *without requirement of one year of general laboratory training.* After that date one year of general training in an approved school will be required.

It should be noted that this applies only to those who were engaged in special fields of medical laboratory work on January 1, 1944.

C.S.L.T. A RECOGNIZED REGISTRY

Several years ago, in order to have some yardstick of approval of the training of laboratory technicians, the Canadian Medical Association, through a Committee of pathologists and biochemists working with the Department of Hospital Service, set up standards for the approval of schools for the training of technicians. It was decided by mutual agreement with the C.S.L.T. that the C.M.A. would recognize that society as the official registry for technicians.

APPROVED SCHOOLS

During the past three years a number of schools for the training of technicians have been approved by the C.M.A. Committee and applications from several other hospitals are now under consideration. Those approved to date are as follows:

*Victoria General Hospital, Halifax, N.S.
Saint John General Hospital, Saint John, N.B.
Hotel Dieu de Montreal, Montreal, Que.
Hôpital Saint Luc, Montreal, Que.
Hôpital Saint-Justine, Montreal, Que.
*Ottawa Civic Hospital, Ottawa, Ont.
*Kingston General Hospital, Kingston, Ont.
*St. Michael's Hospital, Toronto, Ont.
*Toronto Western Hospital, Toronto, Ont.
Toronto General Hospital, Toronto, Ont.
Hamilton General Hospital, Hamilton, Ont.
Mountain Sanatorium, Hamilton, Ont.
*Victoria Hospital, London, Ont.
St. Boniface Hospital, St. Boniface, Man.
Regina General Hospital, Regina, Sask.
Regina Grey Nuns' Hospital, Regina, Sask.
Saskatoon City Hospital, Saskatoon, Sask.
St. Paul's Hospital, Saskatoon, Sask.

The above hospitals, with the exception of Hôpital Saint Luc in Montreal, all offer general laboratory courses of approximately one year. Hôpital Saint Luc offers specialty courses only. Those marked with an asterisk give the general course and two or more specialty courses as well.

* Courtesy of the Anglo Canadian Drug Company.

Editorial

HIGH EXTRACTION WHEATEN FLOUR

DIETARY surveys conducted in Great Britain,[1] the United States[2] and Canada[3] during peacetime indicate that a considerable percentage of the population of all three countries received diets deficient in many food essentials. The Canadian surveys indicated that quite a large proportion of our population was consuming diets inadequate for optimum vigor, efficiency and resistance against disease; in other words, inadequate for optimum health.

One of the deficiencies found in the food consumed by the Canadian families studied was a lack of vitamin B_1. The intake of the other members of the B complex was not investigated. Nine members of the vitamin B complex have been isolated: thiamin, or vitamin B_1, riboflavin, or vitamin B_2, pyridoxin, or vitamin B_6, nicotinic acid, pantothenic acid, para-amino-benzoic acid, choline, inositol, and biotin. There is evidence of additional members of the B complex, although their exact composition and action are not clearly defined as yet. Spies,[4] Sebrell[5] and others have pointed out that a deficiency of one member of the vitamin B complex is almost invariably accompanied by a deficiency of some of the other members of the complex. McHenry[6] has emphasized that since the various members of the vitamin B complex generally occur in the same foods, it can be assumed that these Canadian people were securing an insufficient amount of all the B vitamins. Experimental work by the same author[7] indicates that these vitamins have an interlocking mechanism and that together they are necessary for the normal metabolism by the body cells of not only carbohydrate but also fat and protein.

White flour is one of the most important single items in the Canadian dietary. The amount of white flour moving into civilian consumption in Canada in the years 1935-1939 averaged 183.2 pounds per person per year, or almost exactly one-half pound per person per day.[8] This amount supplies 800 calories. On the basis of the caloric value of all the food moving into civilian consumption during the same period, namely, 3,124 calories per person per day,[9] this means that white flour furnished no less than 25% of the total calories.

Whole wheat is one of our richest food sources of vitamin B_1 and is also a good source of many of the other members of the vitamin B complex. Unfortunately, in contrast to whole wheat, ordinary white flour is poor in various members of the vitamin B complex. It contains only 15 to 25% of the original thiamin content of wheat, 20% of the nicotinic acid, 33% of the pantothenic acid, and about 50% of the riboflavin and pyridoxin. It is therefore obvious that any method for the milling of white flour which will retain a much higher percentage of thiamin and the other members of the vitamin B complex will be most important for the health of the nation.

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2. Bulletin of the National Research Council, Washington, D.C., No. 109, Nov. 1943: Inadequate diets and nutritional deficiencies in the United States.
3. MCHENRY, E. W.: Determination of nutritional status, *Canad. Pub. Health J.*, 1941, **32**: 251.
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   HUNTER, G. AND PETT, L. B.: A dietary survey in Edmonton, *ibid.*, 1941, **32**: 259.
4. SPIES, T. D., HIGHTOWER, D. P. AND HUBBARD, L. H.: Some recent advances in vitamin therapy, *J. Am. M. Ass.*, 1940, **115**: 392.
5. SEBRELL, W. H.: Nutritional diseases in the United States, *J. Am. M. Ass.*, 1940, **115**: 851.
6. MCHENRY, E. W.: Observations on the nutritive value of bread, *Canad. Pub. Health J.*, 1940, **31**: 428.
7. MCHENRY, E. W. AND GAVIN, G.: B vitamins and fat metabolism. I. Effects of thiamin, riboflavin and rice polish concentrate upon body fat, *J. Biol. Chem.*, 1938, **125**: 653.
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   LONGENECKER, H., GAVIN, G. AND MCHENRY, E. W.: Relation of the vitamin B complex and liver and pancreas extracts to fat synthesis, *J. Biol. Chem.*, 1941, **139**: 611.
8. Dominion Bureau of Statistics, Agric. Branch: Food Consumption in Canada, Dec. 9, 1943.
9. Nutrition Services, Department of Pensions and National Health, Ottawa, Jan., 1944.

In 1941, the Cereal Division of the Dominion Department of Agriculture, with the assistance of certain millers and scientific investigators,[10] developed the flour now known as Canada Approved Vitamin B White Flour. Canada Approved White Flour as now being produced in Canada usually contains from 350 to 400 international units of vitamin B_1 per pound, compared with ordinary baker's second patent flour which averages only 160 units. It also contains members of the vitamin B complex other than thiamin in amounts greater than are present in ordinary white flour. In addition to the direct assay figures, the best demonstration of this is the recent report of Owen and McHenry[11], who fed rats rations which were designed to approximate human dietaries in Canada in the ratio of protein, carbohydrate and fat, in which bread was supplied in the proportion of six slices per 2,500 calories, and in which rations bread was the only source of the B vitamins. Separate administration of thiamin, riboflavin, pyridoxin and pantothenic acid showed that whole wheat bread, in the proportion used, supplied optimum amounts of thiamin, pyridoxin and pantothenic acid and practically an optimum amount of riboflavin; Canada Approved White Bread furnished nearly an optimum amount of thiamin, pyridoxin and pantothenic acid but insufficient riboflavin, while ordinary white bread was deficient in all four vitamins.

Moran,[12] Director of Research for the British Ministry of Food, in his excellent article on "Certain Nutritional Aspects of High Extraction Wheaten Flours" (in this issue) presents valuable information on the distribution of various nutrients in the wheat berry. He points out that the germ supplies only 3% of the total thiamin of wheat, whereas the scutellum which surrounds the germ and constitutes only 1.5% of the weight of the wheat berry contains no less than 59% of the total thiamin of the wheat. Moran states, "It is clear therefore that to obtain a flour of high thiamin content the milling should be so regulated that the bulk of the scutellum is included in the flour. This is the explanation for the high content of English National Flour, in which it averages 1.0 I.U. per gram, and is probably the explanation for the relatively high content of thiamin in Canada Approved Flour." Other information of great practical value is given.

It is hoped that the cereal chemists and millers of Canada will extend these studies and apply the information in the milling of high vitamin white flour for the Canadian public. From the figures quoted by Moran it would in fact follow that a thiamin content of at least 500 I.U. per pound is the theoretical target. F.F.T.

10. TISDALL, F. F., JACKSON, S. H., DRAKE, T. G. H., NEWMAN, L. H., WHITESIDE, A. G. O., MILLER, H. AND EDGAR, J.: The retention of the wheat vitamins in flour and bread—A problem of national importance, *Canad. M. Ass. J.*, 1941, **45**: 101.

11. OWEN, A. T. AND MCHENRY, E. W.: Observations on commercial bread as a source of B vitamins, *Canad. M. Ass. J.*, 1944, **50**: 138.

12. MORAN, T.: Certain nutritional aspects of high extraction wheaten flours, *Canad. M. Ass. J.* This issue.

Editorial Comments

Preventive Medicine in War

A striking picture of the importance of hygiene in warfare is given by Lieut. Col. H. S. Gear in an account of this aspect of the El Alamein victory in 1942.* He points out the extraordinary difficulties in maintaining hygienic supervision under the conditions of the retreat in June, 1942: units became scattered; camping sites could not be established and the ground became badly fouled. A serious menace to the hygiene of the army arose also in the hordes of natives, Bedouins, and others, who were caught back in the retreat and who settled in the rear of the army with all their unsanitary habits of living. Another factor of some importance was the inclusion in the Eighth Army on the eve of the El Alamein battle of men fresh from overseas, who had not become properly adapted to desert conditions. Lastly, the crucial fighting took place in the late summer and autumn when Egyptian health hazards were at their worst. Flies particularly became a serious plague and special measures had to be taken to deal with them.

One of the first problems to be dealt with was the re-organization of the field hygiene sections, to meet the mobility of desert warfare. This meant doing away with the rigid attachment to divisions and the formation of corps and army pools of hygiene personnel, from which men

* Hygiene Aspects of the El Alamein Victory, *Brit. M. J.*, 1944, March 19, 383.

could be drawn as needed. This was found to meet the conditions of the now well known dramatic continual forward movement of the Eighth Army in its long sweep across North Africa.

The methods evolved and the difficulties overcome are all well described, and are of great interest. It is just as interesting to learn something of what was done by the "other side" in dealing with the same problems. A previous comment has been made on the inefficiency of the Italian antityphoid methods in the earlier fighting. In the El Alamein campaign, however, we were dealing with the Germans also, and it might have been expected that their hygiene would have been more rigorous. But apparently the evil communications of the Italians had lost none of their proverbial capacity for corrupting better standards for the camp conditions which were encountered by our forces as they pushed across the well fought over ground, were almost incredibly bad in all the enemy units. One of our hygiene officers reported:

> "That portion of the battlefield previously occupied by the enemy is just one huge fly farm, and has to be seen to be believed. Whilst both Germans and Italians order the use of shallow trench latrines (and no oil seal), this order is scarcely ever carried out. Enemy defensive localities are obvious from the amount of fæces lying on the surface of the ground."

The price of this neglect was very high. Questioning of captured medical officers showed that between 40 and 50% of their front line troops were affected by disease, a proportion so high that there can be little doubt that it definitely played a large part in our victory. In no campaign has there been a more brilliant demonstration of the value of preventive medicine; or, conversely, of the inevitable cost in lives and efficiency of its disregard.

Medical Economics

ABSTRACT OF THE WHITE PAPER TABLED BY THE BRITISH GOVERNMENT

[*The following abstract has been prepared by Dr. A. E. Archer. It is taken from the Supplement to the "British Medical Journal", February 26, 1944.*]

PRINCIPLES OF GENERAL PRACTITIONER MEDICAL SERVICE

The family doctor is the first line of defence in the fight for good health—as a rule he will be consulted first and through him access will be had to others. Necessary services such as specialists, consultants, hospital care, are included.

It is of first importance that every one be free to choose his or her own doctor—while admitting this, if the State is to provide a universal service, there must of necessity be some intervention.

DEVELOPMENTS WHICH MAY BE ANTICIPATED

(*a*) *Group practice.*—Group practice is discussed. It must be in the forefront of the planning for National Health Services, but this "cannot represent the whole shape of the future". Any such development will take time, and for some time and in some districts there will be individual practice. It is necessary, therefore, to plan for a combination of group practice and separate practice.

(*b*) *Health centres.*—It is planned to give full scope to the development not only of group practice but also to a full Health Centre Scheme.

It is anticipated that in the development of the Health Centre many individual doctors, in joining the health centre, will bring in their whole practice with them. However "the wish of the local doctors to bring their work into the centres must obviously be a big factor in the decision to provide a centre, but in the last resort, the decision will rest on the public interest".

It is planned to have Health Centres set up under a plan which requires action by local authorities as to location, size of district, size of group premises, etc.

(*c*) *Separate practice.*—A doctor in "separate practice" will engage himself to provide ordinary medical care and treatment to all persons and families accepted by him, under the new arrangements, but he will be backed by the new organized service of consultants, specialists, hospitals, laboratories and clinics of which he will be enabled and expected to make full use

(*d*) *Distribution.*—To secure a proper distribution of medical personnel, some regulations controlling new entrants into any practice will be necessary.

(*e*) *Central Medical Board.*—A Central Medical Board will be established and this Board will be the "employer".

The general practitioner service will be centrally organized. "As the doctors will be remunerated from public funds the Minister himself must be ultimately responsible for this central administration", but he will appoint for this purpose the Central Medical Board.

In the case of Health Centres a third party enters the picture, the "local authority". This local authority "sets up" the Health Centre and must have a voice in its operation.

The Board will also watch over the general distribution of public medical practices. In "separate" practices the Board must consent before a vacant practice is filled or a new one established. In Health Centre practice, the centre will be the agency through which new doctors are introduced.

The Board is to be a small body with a few full-time members and the rest part time. Since the Minister is responsible for the service, the Board will be appointed by him, but all appointments will be made in close consultation with the profession.

(*f*) *Remuneration and terms of service.*—These are matters for discussion with the medical profession. The Government however, puts forth certain proposals. They say that it would be easiest to put all on salary, but admit that this is "highly controversial". They say that both the opinion of the doctors and of the laity is divided on this matter.

The Government approaches the problem "solely from the point of view of what is needed to make the new service efficient". In a Health Centre, these doctors "should not be in competition", therefore the capitation system is inappropriate and they propose that these men should be on salary, or some basis other than capitation, and they will be ready to discuss with the medical profession which method should be adopted and the appropriate salary scales. This would apply also, probably, to doctors in group practice. Normally in the case of the separate doctor, the capitation system would apply, with careful regulation of the size of the panel.

In any system, "the substantial issue will be to decide what is, on ordinary professional standards, a reasonable and proper remuneration for the whole-time doctor engaged in a public service".

(*g*) *Private practice may be retained.*—They hope to get the majority of doctors to engage in the new service and therefore "it is not proposed to prohibit" any doctor who enters the service from also treating the private patients "who do not desire to take advantage of the new public arrangements". If he wishes to do this, he will have fewer public patients on his panel.

Also the doctor who is on salary will be allowed "to treat the few who will not want to take advantage of the new public service", privately.

"The essential point is, that no person must have reason to believe that he can obtain more skilled treatment by paying privately for it than he can in the public service".

(*h*) *Entry into public service.*—"There is a strong case for and the Government proposes" that young doctors go through a short period as assistants to more experienced men. Also Government must be able "to require the young doctor during the early years of his career, to give full time to the public service, if the needs of the public service require this".

As the new system is set up, there will be compensation for the sale value of practices in certain areas.

Superannuation rights will be arranged in Health Centres.

The matter of the sale and purchase of practices is to be left for further discussion.

(*i*) *Drugs and appliances.*—These will be supplied, but with perhaps some fee to the patient.

(*j*) *Hospitals.*—"A fully organized system of hospitals is the keystone of the National Health Service". This system must be complete and hospitals "ready of access". "The Government proposals are based upon the fullest co-operation between the two hospital systems in one common service". There should be a planned hospital service in each area. "To achieve this object and to remedy the present lack of coherence there is need for a single authority which 'has the duty to secure for that area a complete hospital service'."

UNIT OF HOSPITAL ADMINISTRATION

A hospital area must fulfill three conditions:

(*a*) It must have sufficient population and sufficient financial resources to make possible an adequate efficient service.

(*b*) It should normally include both rural and urban areas.

(*c*) It should be such that most of the varied hospital and specialist services can be organized within its boundaries in a self-sufficient scheme, leaving only certain highly specialized services for inter-area arrangement.

Voluntary hospitals.—These should receive "certain payments from the authority" in accordance with centrally determined scales, and "being less in amount than the total cost of the service rendered". There is no question of these hospitals surrendering their autonomy.

Mental hospitals. — These create some difficulty but "despite the difficulties the mental hospital service should be taken over by the new joint authority".

Infectious disease hospitals.—Should be taken over as a part of the plan.

Routine inspection of hospitals "at not too frequent intervals" is provided for.

Local tuberculosis dispensaries will henceforth be regarded as out-patient centres of hospital consultant service.

(*k*) *Dental service.*—Is highly desirable, and should be a full service, but there are not enough dentists at present.

(*l*) *Administration.*—Must be under the Minister of Health, but only the general practitioner service will be centrally controlled. For the rest "there will be local responsibility with control at the centre". "Though it is in the Minister of Health that the responsibility must rest, the government attaches great importance to ensuring that the service is shaped and operated in close association with professional and expert opinion".

"Set up by statute, at the side of the Minister, is a special professional and expert body to be called the Central Health Services Council". This body is advisory, while the Central Medical Board is an "Executive body responsible to the Minister".

The Council will have the right to advise on "any matter within its province". The Minister will be obliged to submit a report annually to parliament of the work of this Council.

(*m*) *Consultants.*—It is desirable that provisions should be made for "every one to obtain whenever he needs it and without charge" skilled specialist advice. "The government consider that a service of consultants can be best and most naturally based upon the Hospital services".

"The Hospital will itself enter into arrangements with the Consultants and specialists concerned". There is need for more consultants and for better distribution. (Apparently Hospital payments will include enough to provide for the services of consultants and specialists.)

Consultants might perhaps be associated with more than one hospital. They should be employed either on a full time or part time basis and there will be need for central control "to avoid competition".

(*n*) *Child welfare.*—Child welfare is to be cared for by another department related to Education.

(*o*) *Maternity.*—Maternity benefits must include arrangements for home nursing, midwifery and health visitors.

(*p*) *Financial arrangements.*—"The cost will fall mainly upon central and local public funds. It will be met partly by the ordinary process of central and local taxation and partly by an insurance contribution under whatever social insurance scheme may be in operation".

THE SASKATCHEWAN HEALTH INSURANCE ACT

[*The College of Physicians and Surgeons of Saskatchewan has issued a detailed account of the stand taken by it regarding the passage of the Saskatchewan Health Insurance Act.*

This Bill was brought before the Legislature on Friday, March 31, 1944, when it received its first and second readings, and was assented to on the following day. The third reading was held up by the attendance at the Legislature of a delegation of 8 doctors, who requested that an opportunity be given the profession to register a protest and make representations before the final passage. The College makes the following statement.—EDITOR.]

"The College had offered its findings, information and conclusions to Premier Patterson last January, who acknowledged the offer. A Special Committee had prepared a brief and had presented it to the Cronkite Reconstruction Council on March 9. Mr. Cronkite had asked that the Committee submit specific answers to definite questions within a month.

"Absolutely no indication was given the profession at any time that a Bill was being contemplated, and the doctors were taken completely by surprise when on the day before the closing of the Legislature, the Bill was put through.

"Dr. Gareau convened eight doctors at 8.30 in the evening and attended with them and the Secretary on Mr. Hogarth and Mr. McDaniel. Dr. Uhrich was tied up on the floor of the Assembly and could not be seen, but through Mr. McDaniel promised that the Bill would not receive its third reading that evening, and agreed to meet the delegation at 11.00 o'clock next morning, Saturday, April 1.

"The delegation consisted of: Drs. Gareau, J. L. Brown, Valens, Argue, Anderson, James Miller, Dakin, Ritchie, Good, and the Secretary.

"The Pharmaceutical Association had a delegation meet a Special Committee in the Assembly that morning, and this delegation of four met our delegation and asked whether they could sit in with us on the protest. The doctors did not object, and they accordingly joined our delegation."

PROTEST TO THE MINISTER

"Dr. Gareau opened the discussion by protesting to the Minister, who had his Deputy with him, the fact that no opportunity was given to make representations on this Bill and the hasty manner in which it was rushed through in the last hours of the Legislature. He offered to confirm our representations and submit them to the Minister in writing at a later date. He then asked the Secretary to act as spokesman for the delegation.

"The Secretary repeated the protest of Dr. Gareau, and stated that the medical profession felt that it had a just grievance in receiving no opportunity to present their views after they had given the subject of socialized medicine close attention for several years, and after a Special Committee of twenty-one men of the College having made an intensive study for the last ten months. This Committee had arrived at definite conclusions on questions of principle and some firm ideas on incidental questions, and to have now a Bill foisted on them so rapidly without a hearing, was startling and embarrassing.

"The protest the doctors wished presented was two-fold in nature. First, against the method adopted in the passing of the Bill, and second against the Bill itself. The objectionable sections in question were Sections 4, 8, 10, the omission of representative committees under 11, and Sections 13, 14, 16 and 20. The gist of the objection to the Bill is, in its failure to provide for representation on the Health Insurance Commission from the various groups affected, among them the medical profession, and failing to provide for representative advisory committees.

"After the Secretary had gone through the Act, Dr. Valens spoke and registered astonishment at the passing of the Bill, and advised that the profession would take serious objection to it and would hold the Health Insurance Study Committee remiss in its duty if it failed to protest.

"Dr. Miller asked that the Act be not brought into effect without proper safeguards for the rehabilitation of the medical personnel now engaged in the Armed Forces in order that they may have an equal opportunity with the men not in the Services.

"Dr. Brown made the point that this Act will be held up as an example in other parts of the Dominion, and as such it had its dangerous aspects, even though it appeared to be innocent enough in itself.

"Dr. Anderson agreed with Dr. Brown, and expressed the fear that if the Bill is in effect when a dangerous element may be forming the Government, it could have disastrous results.

"Dr. Argue emphasized that if this Bill were presented to the members of the College, not a single one would accept it, and that it will cause an uproar in the profession.

"Dr. Dakin associated himself with everything that had been said by previous speakers, and Dr. Ritchie did likewise after he had congratulated Dr. Uhrich on his long and excellent service in the Government and expressed regret at his prospective retirement."

THE MINISTER'S REPLY

"Dr. Uhrich, the Minister, then replied, and reviewed the history behind this Bill as follows:

"The Legislature (*not* the Government) had set up a Select Committee to study Health Insurance during its preceding session. This Committee held many meetings and received briefs from all groups. Later, the Reconstruction Council was set up to continue the study, and was still continuing its work. The Select Committee however, had brought its report into the Legislature and recommended the principle which this Bill adopts. He stressed the point that the Government had no alternative but to take the action it did, and as the Committee's report did not come down until late, the Bill could not be presented earlier than it was. He pointed out the difficulties in drafting the Bill, and that five drafts had been made before the one presented.

"The Minister insisted that as the profession had filed briefs both to the Select Committee and the Cronkite Reconstruction Council, both of which are designed to prepare a preliminary survey to set up a health security plan, the profession had had ample notice and should not have been taken by surprise.

"Secondly, the Bill in itself is not a Health Insurance Act in the sense that it brings any plan or scheme into effect, but that it is merely an initiating, enabling Bill, and as such quite innocuous. The Commission is going to enquire into and make tentative arrangements for a health insurance plan, and when its report comes in, then the Government of Saskatchewan will enter into an agreement with the Government of Canada, if Parliament has passed its contemplated Health Insurance Act.

"The Minister admitted that no provision was made for representatives from the various groups, but he insisted the Bill did not prevent any group from having representation. Just as it does not say that the Chairman of the Commission shall be a doctor, it does not say on the other hand, that the Chairman shall *not* be a doctor. He closed in saying that there was nothing startling in the Bill, and there was no reason to be either alarmed or suspicious.

"The Minister was then asked whether the Health Insurance Commission under the present Bill would be the Health Insurance Commission under the scheme when in effect. He advised it was impossible to say who would be the Commission to carry out a health insurance plan in Saskatchewan.

"The delegation insisted that its objection still stood, because notwithstanding their briefs presented earlier, which concerned themselves with health insurance plans, they were taken completely by surprise by this Bill, on which they should have had an opportunity to insist that even on the initiating Commission they were entitled to representation, so that any report this Commission may bring in will have the benefit of the profession's study and stand."

The meeting closed at 1.50 p.m.

"Dr. Kirby wired a protest to Premier Patterson, as well as Mr. Brocklebank and Mr. Carl Stewart on Friday night, April 2. The wire read as follows:

> 'Regret to inform you introduction Health Insurance Bill without consultation with College of Physicians and Surgeons grossly unfair. We are principally concerned in implementing the scheme, despite the fact nearly one-quarter our members are on active service. Urgency for action not apparent when Dominion Enabling Act still in formative stages.'

"After the Secretary had reported on the above, Dr. Brown thought that the protest should be confirmed and gotten out as a Bulletin to the profession, and the C.M.A. should be advised. Dr. Valens agreed, but thought that the protest should not come before the public. Dr. Miller moved and Dr. Brown seconded that the protest be confirmed in writing to the Minister, and a copy thereof be sent by registered mail together with a copy of Bill 69, to each member of the College of Physicians and Surgeons, and that the local District Medical Societies be asked to consider the matter at their earliest meeting. The motion carried.

"Dr. Miller moved and Dr. Kirby seconded that a copy thereof be sent to the C.M.A. and to the Provincial Associations, and that Dr. Agnew be given a copy as well as a copy of the Minutes of this meeting. Carried.

"Dr. Anderson advised that he had prepared a statement and read the same for a release to the Press of the Province, and it was left to Dr. Anderson to frame it in its final form, having regard to the consideration that while we want to make our point clear, we do not wish in any way to embarrass the Government."

A LETTER FROM DR. ALFRED COX

[*The Editor is glad to number amongst one of his most faithful correspondents Dr. Alfred Cox, of London, Eng. Dr. Cox, now retired, is well known to many of us in Canada. No one is following developments among us with keener interest and sympathy than he shows. He has only recently recovered from severe illness, and has taken the opportunity to send a long and interesting letter, the greater part of which is reproduced herewith.*—EDITOR.]

All the copies of your *Journal* were kept for me and I have been through them. I think the last copy, dated February, contains more material than usual which interests me, though I missed anything of the medico-literary kind which has been such a feature of your *Journal*, except the "Quiz".

It is astonishing how closely your problems resemble ours but perhaps not so astonishing that the discussion about them, and the alternatives proposed, are so much like what came out of the debates by our Medical Planning Commission. You may have seen that our Minister of Health has published his long promised White Paper and there is no doubt *that* document is greatly indebted to our M.P.C. It is a very ingenious document, designed, it seems to me, to "buy off" as much opposition as possible. But in spite of this it has only deferred the discussions and "bargaining" that must take place, for it sticks largely to generalities.

The criticism which is most common amongst men of the profession that I meet is that, whichever way you look at it, in spite of its agreement that doctors should be free to come into the new Service or stay out of it, or to come into it for part-time and have private practice for the rest of their time, the result in the end will be a salaried Service very much on Civil Service lines. I don't think the public is yet aware of all that this would mean to them but medical speakers in Parliament, particularly in the House of Lords, are doing their best to show that "all is not gold that glitters".

My chief criticism of the proposed comprehensive scheme is that for doctors, while there would be no blanks there would also be no prizes. Careers such as those of our successful surgeons and physicians (*e.g.*, Dawson, Moran, Horder) would be impossible. If the Service became whole-time, unless things were greatly changed, no member of the profession could go into Parliament or on to a local Council unless he was prepared to give up his profession altogether, and no member of it could expect to reach more than a comfortable mediocrity in income.

There is another great difficulty which I see in the proposal that doctors in the Service should be able to do private practice as well as public, and I see no way out of my dilemma. Rightly or wrongly, as shown by our insurance system, there is a considerable proportion of the public who cannot be convinced that they get as good a service inside as outside. A fair number of the present insured make use of men who are not on the panel, and this number would, I am sure, be greatly increased when we take in the better-off sections of the public. Even if convinced that the technical service is good inside the service, such people would be willing and anxious to pay for private treatment with its amenities which are hardly consistent with work at a health centre. And it is betraying no secret to say that there will be a considerable section of the profession who would be willing to foster this idea in the minds of the public, as was shown after our Insurance Act came into force. There is still a fair number of general practitioners who pride themselves on doing no insurance work.

How this dilemma is to be solved I cannot say, and the only answer I have had to it, from responsible people, is that *good* doctors would always do *good* work under any system of payment, and that the force of circumstances will compel most doctors to go into the new Service. We are all prepared for a considerable period of hard bargaining and the clearing up of many of the details which are not dealt with in the Report. The position of the Consultant is still quite obscure.

I was much interested to read the account you give of a speech by Mr. Jolliffe. It reminds me of the White Paper—promising almost everything to everybody, and I should be very suspicious of the C.C.F. because its intentions are obviously those of our Ministry of Health, *viz.*, to get a nice manageable Civil Service of doctors. I note that Mr. Jolliffe says that all payments would be by salary, and on this point I was very interested in the letter of Dr. Perl. The latter thinks that the payment-for-service method is the best, and I am inclined to agree with him, if experience had not shown that, under any system financed by the State, it is impossible, because the State *must* know what it has got to budget for and therefore the amount that is to be paid out to the doctors in each area would be calculated beforehand on an actuarial basis. This, in our experience, "kills" the P.F.S. method.

In our present insurance system it is open to any insurance area to pay either by capitation or by P.F.S. and two areas in Lancashire adopted the latter method—but only for a few years. They found that the number of doctors who were trying to get as much out of the "pool" as possible by unfair means, was sufficient to ruin the system, and after stubbornly trying to make it work for several years, they gave it up. I cannot see how any P.F.S. system could work if you grant that the amount of money for the medical profession would be limited.

The letter from Dr. Perl reminds me that you have been more lucky this month in the matter of correspondence, and I am glad. I can well

believe that you regret that more doctors don't write to you, though still I cannot understand why a Canadian doctor should differ so much from a British one, in this respect. Our Editor is flooded out with letters and the number that appear constitutes only a minority of those he receives. To my medico-political mind the correspondence pages of the Journal are the most interesting. It must be aggravating to any Editor to receive so little "spontaneous comment" on his journal, and I feel sure that, as you say, you are quite ready for either good or adverse criticism. The case of Hilda Werden's letter on the "Irregulars" was a good one in point. I can imagine what a flood of correspondence would have followed it if it had appeared in our Journal!

I don't know how our new system proposes to deal with the "Irregulars" but they are not such a problem here, thank goodness, as they are in Canada and the States. But whatever Service is offered, however good it is, there will always be a large number of people attracted by patent medicines and "irregular" practitioners, and I for one am all against trying to prevent "irregular" practice because I think experience has shown all over the world that it cannot be done. Of course I am entirely against their recognition by the State. I think that the principle on which our Medical Register was founded, *viz.*, that of enabling the public to distinguish between people who had passed certain tests, and those who had not, is a sound one.

London, March 21, 1944.

Men and Books

HISTORY AS IT IS MADE

By Ross Mitchell, M.D., F.R.C.P.(C)

Winnipeg

Through the kindness of Col. A. Graham Butler, a member of the Australian War Memorial, I have been privileged to receive four books* which deal with the activities of Australians in the present war. The Australian War Memorial, conceived on the battleground of Bullecourt in 1918, has to its credit on the literary side a magnificent history of the Australian war effort in World War I, including a three-volume history of the Australian Medical Services 1914-1918, this latter edited by Col. Butler. Official paintings and photographs of the last war were reproduced in a splendid volume entitled "Australian Chivalry".

In the preface to "Australian Chivalry" there is this quotation from Ruskin: "Great nations write their autobiographies in three manuscripts—the book of their deeds, the book of their words and the book of their art."

The Australian War Memorial, functioning continuously from 1918 on, still cherishes this saying, which for a second time has been verified by Australia's sons and daughters. The first of the four books dealing with the present war was published in 1941. It covers the fighting in Libya, Greece, Crete and Syria. The other three were published in the following year. "Soldiering On" covers the campaigns in Ceylon, Malaya, Java, Timor, New Guinea and Northern Australia. "H.M.A.S." deals with the exploits of the Australian navy in the Mediterranean and other seas, and "These Eagles" is the story of the Royal Australian Air Force.

These four quarto volumes, of from 130 to 200 pages each, are profusely illustrated with colour plates, photographs and line drawings. Some of the colour plates are from paintings by the official war artists, but the greater number of the illustrations are by members of the armed forces. The books themselves are best described as illustrated notebooks. In the words of the editors, "They are figurative notes which aspire only to outline the human pattern of a great unfinished story". It is their human character which gives them their charm. They reflect the spirit of the fighting "Aussies": courageous, roistering, reckless, humorous, zestful of life.

Such books must be a splendid aid to the morale of the people back home. They depict the lives of their sons, daughters, sweethearts, husbands. No outsider can read them without a warm glow of heart at the thought of the magnificent spirit of the men from down under.

To a Canadian reader, however, a second thought is disconcerting: What has Canada to offer along similar lines? Our war correspondents and war photographers have done nobly, risking their lives even to the death, and in isolated articles, particularly in the Canadian Geographic Magazine, the literary ability and artistic sense of a few of Canada's fighting men have been shown. Yet there has been nothing produced in Canada with the scope of these Australian books, or with government or national sponsorship.

It may be granted that the strategy of this war prevented active participation by Canadian forces as soon as their Australian and New Zealand cousins, but, even so, Sicily and Italy are already becoming old stories, and the great invasion of Europe may break at any time. Surely it is not necessary to wait until the great events are over before beginning to chronicle them. Better to capture the spirit, even imperfectly and fleetingly, while it is still alive, than to set it up as a dead museum piece after the war is over and done with.

Surely the deeds of the Canadian army at Dieppe, Sicily and Italy, of Canadian airmen

* Active Service, Soldiering On, H.M.A.S., These Eagles, Canberra, the Board of Managament of the Australian War Memorial.

in their forays over Germany, and of Canada's navy on Atlantic convoy with the ever-present menace of the U-boat, make a tale that stirs the heart like a trumpet. The story of the Empire Air Training Scheme which has brought together on Canadian soil the brave young manhood of Britain, Australia, New Zealand and Canada is itself an epic. It is not necessary that the war effort of Canada be presented in precisely the same way as the Australian War Memorial has done, but there is need that it be presented truly, graphically, in the present and on national lines.

VESALIUS

By H. E. MacDermot, M.D., F.R.C.P.(C)

Montreal

When one thinks of the chaos in Europe one is even more than ordinarily thankful for Osler's resolute solicitude in acquiring the priceless books which he eventually transferred to this side of the Atlantic. Amongst these were several copies of Vesalius' *Fabrica,* so many (in terms of such a book) that he twice bestowed duplicate copies on libraries he had already favoured with it.

It is possible that other men would have acquired these Vesalian treasures, but the fact remains that Osler was responsible for many of the fine copies now in Canadian and American libraries. A rival, indeed a very great rival, to Osler in the collection of Vesalian works, was the late Dr. Harvey Cushing, whose *Bio-Bibliography of Andreas Vesalius* has just been brought out as Publication No. 4 of the Historical Library of Yale.* The book is indeed a worthy reminder of the man who created the first accurate account of the structure of the human body.

In spite of all the pains that have been taken in the matter we know disappointingly little of the life of Vesalius. Perhaps we should be thankful for as much of his work as we have. After all, there is the *Fabrica* in all its glory; it is hard to see what he could have produced beyond this that would not have been an anticlimax. Still, we can never know too much about a great man, and Dr. Cushing shows us how much more there is that we should like to know about Vesalius.

The main facts of his life are quite clear. He was born at Brussels in 1514, and five successive generations of physicians in his family were good and sufficient reason for his turning to medicine. His mother was of English stock. By the time he was 15 he had attended cases of plague and had done some surgery. There never was any doubt of what he wanted to do. He might have been famous as an anatomist even without the *Fabrica,* for at the age of 28 he had probably done more dissection of the human body than anyone else in his time. Leonardo da Vinci is the only one to be named in the same breath as Vesalius in this respect, but marvellous as are da Vinci's work and drawings, he was not primarily an anatomist.

At the age of 23 Vesalius was professor of surgery at Padua and was teaching anatomy there. Six years later (1543) he published his *De Humani Corporis Fabrica.* Soon after this appeared he abandoned his anatomical work altogether, burnt his papers and books and went to act as physician to Charles V. From then on he was just another surgeon, seeing active service in his master's campaigns but leaving no impress in medicine. In 1563 he went on a pilgrimage to Palestine and was shipwrecked and died on the island of Zante.

It is difficult to think of any great figure in medical history who gave up his work so abruptly and at such an early age as did Vesalius. To produce the *Fabrica* in as short a time as he did was of course a *tour de force.* He not only had to prepare the text, but he had to supervise the drawings, and finally he went to Basel and watched the book through the press. Perhaps the strain of the work was partly responsible for the tragic impatience with which he reacted to the criticism which his book brought down on him from the supporters of Galen. He was always impulsive, but in destroying his papers he showed more than his ordinary irritability. Fortunately, the *Fabrica* was then safe. He said in later life how deeply he regretted his hastiness, but he did no more anatomical work, although he was on his way back to take up a post as professor of anatomy when he died.

Who reads Vesalius now? The answer is, quite definitely, no one. For one thing, it has never been translated from the Latin. Dr. Cushing tells us that a beginning was made at a French translation some four centuries after its publication, but as the total cost (for it was to have been an edition de luxe) would have been about $40,000, it was not completed.

But many look, and always will look, at its illustrations by Stephen van Calcar, the young genius who died not long after the book appeared. We do not examine them for anatomical information, for, accurate as they are they do not tell us as much as our modern anatomies. But nowhere else do we find skeletons and partly dissected forms greeting us with such dignified and graceful unconsciousness of their deshabille. Those who learnt their anatomy from Vesalius had the structures unveiled for them not as repulsive mutilations but as finely drawn parts of a pageant.

The pictures themselves, and the making of them form an inexhaustible subject of discussion amongst students of Vesalius. They make us feel, as no written account can do, the freshness of the whole of his work. We know that he had

* A Bio-Bibliography of Andreas Vesalius. Harvey Cushing, Schuman's, New York, 1943. $15.00. Edited by Dr. John F. Fulton.

difficulty in getting the illustrations made, but even if we did not have his word for it it would be a fairly reasonable surmize. Sketches must of course have been made at all stages of dissection, and as there was no method of preservation by injection methods(which would have implied a knowledge of the circulation) conditions must frequently have severely tested the endurance even of Vesalius. What van Calcar must have thought of it we can only imagine. The "anatomies" as the dissections were called, were frequently performed in public before large crowds, and even if all the drawings were not made then many must have been. The dissection sometimes went on until late at night. Since complaints were made of cold at times the dissecting was probably done mostly in winter.

There was no regular dissecting room. The famous frontispiece of the *Fabrica*, on which so much discussion has been spent, was allegorical in nature, although many of the figures may have been types of people who watched. Vesalius of course we are sure of. Dr. Cushing liked to think that van Calcar also is shown in the rather cherubic figure sitting with a book propped up in front of him, the suggestion being that the book is a drawing tablet. Everyone has his own interpretation of the scene, but however one translates it there is never any doubt of its attractiveness.

Another detail which allows us to follow the artist so intimately in his work is the landscape which appears as a background in so many of the plates of the *Fabrica*. This has been shown to be a sketch of a part of the country which has been identified as an actual scene in the Euganean Hills in Italy.

To add to the interest of the story, many of the original wood blocks of the illustrations are still in existence. How they managed to survive is a mystery. Perhaps it was because of their very bulk. Their first voyage was across the Alps from Venice to Basel in Switzerland, where the book was printed. In the following centuries they were sent around to various cities in Germany, and it is thought possible were even taken to the Netherlands as part of Vesalius' belongings. They went to Leipsig, to Augsburg, and finally to Munich, where they now lie, or did in 1934 when the New York Academy of Medicine obtained permission to use them to prepare a special atlas de luxe. The prints from them are as fresh today as in 1543. Indeed, on the special paper used in the Atlas, they are much sharper, and would be a delight to van Calcar and Vesalius.

The making of these woodcuts must have been carried out by more than one craftsman, for as Spielmann shows, it would have been physically impossible for one man to do them all in the time in which the *Fabrica* was prepared. The cutting was an art of the highest order, and was quite different to the engraving which later on superseded it as a method of reproduction.

One of the puzzling aspects of the life of Vesalius is the almost complete absence of any contemporary reference to him or his work, beyond the criticisms of his enemies. We know him to have been an extremely keen and active personality, who was supposed during his years of teaching at Padua, the greatest university of the day, to have attracted great numbers of students. It is unusual, to say the least of it, that no one should have left any account of his teaching, or his public dissections, or of the man himself. He may have been unpopular, but that has never been an excuse for disregarding a man. It is even more curious perhaps that Vesalius should have been so extremely reticent, to call it by no harsher name, about the artists who helped to make his book. Nowhere does he ever say definitely who did the drawings or cut the blocks, much less does he give any praise of them. There is nothing to prove conclusively that Vesalius was not his own artist. He grumbles about the trouble he had with the artists, but he still might have dispensed with them after all.

That Calcar had something to do with the illustrations we may be fairly certain; that he drew most of them is likely. Beyond that verdict no court of justice would venture. Perhaps it is as well that the question is still open, otherwise we would be deprived of one of the most interesting historical and biographical mysteries.

CATECHISM IN MEDICAL HISTORY

By Heber C. Jamieson, M.B., F.R.C.P.(C)

Edmonton

QUESTIONS

1. What Irish clinician of the early nineteenth century, with only a six-bed ward at his service, gave a classical description of a disease, and whose name still suggests phenomena observed in cardiovascular conditions?
2. A medical discovery of great importance to tropical and sub-tropical countries inspired a poem by the discoverer. Who was he and what was the poem?
3. What ancient poet was the first to mention army surgeons?
4. What late Regius Professor of Medicine in a famous English University was said to have been the hero of one of George Eliot's novels?
5. Name two well known plays in which the effects of syphilis are forcibly presented.
6. What is the origin of tattooing?
7. What well known American anatomist wrote a novel which was known as the serpent story of literature?
8. What custom of the ancients and continued by early Christians must have been trying to a hay fever patient?

9. What famous idol of Bible times was worshipped in an odd manner by sufferers from intestinal disease?
10. Captain Robert Davies, a Canadian Engineer, was recently presented with a stethoscope by the interns of a London Hospital. What was the reason?

ANSWERS

1. Sir Dominic John Corrigan (1802-1880). Corrigan's original account of aortic regurgitation is a masterpiece of detailed observation. Corrigan's pulse (water hammer), and Corrigan's sign (expansile pulsation in aneurysm) are well known. Fibroid phthisis, which he described minutely, sometimes bears his name today.
2. Sir Ronald Ross proved that the mosquito was responsible for the transmission of malaria. This poem commemorated the event.

"This day relenting God
Hath placed within my hand
A wondrous thing; and God
Be praised. At His command,

Seeking His sacred deeds
With tears and toiling breath,
I find thy cunning seeds,
O million-murdering Death.

I know this little thing
A myriad men will save.
O Death, where is thy sting?
Thy victory, O Grave?"

3. Homer. In the Iliad he writes of wounds and their treatment. Two sons of Æsculapuis are mentioned.

"Patroclus cut out the sharp shaft and cleanly washed away
With lukewarm water the black blood; then 'twixt his hands he bruised
A sharp and mitigatory root, which when he had infused
Into the green, well cleansed, wound, the pains he felt before
Were well, and instantly allayed, the wound did bleed no more."

Machaon views a wound.

"Then medicines, wondrously composed, the skilful leech applied,
Which loving Chiron taught his sire, he from his sire had tried."

4. Sir Clifford Albutt (1836-1925). It is said that the Regius Professor of Cambridge who was a friend of the authoress served as a model for Dr. Lydgate, a struggling doctor.
5. "Ghosts" by Henrik Ibsen, the Norwegian dramatist, and "Damaged Goods" by Brieux, a French dramatist. The latter also wrote a play "Maternity".
6. Very probably it was derived from the custom of primitive peoples of painting various designs of many colours on the skin to ward off the evil demons.
7. O. W. Holmes. He wrote "Elsie Venner", a study in heredity. Elsie showed from infancy unmistakable traces of a serpent-nature intermingling with her higher self.
8. That of saying "God bless me" every time he sneezed. It was believed if a person sneezed and died immediately his soul departed through his nose. Many European countries have such a custom at the present time.
9. Baalpeor, the god of the Amorites. For alleviation of rectal and intestinal ailments, the devotee exposed his naked posterior to the altar and relieved his bowels as an offering to the god.
10. Captain Davies borrowed their stethoscopes so often to ascertain if a bomb had a timer, that they knew the gift would be frequently used.

Divisions of the Association

Alberta Division

The Provincial Medical Association decided that owing to the many physicians in the services, the regular scientific district meetings would not be held in Alberta this year.

British Columbia Division

A general meeting of the British Columbia Medical Association was held on April 19 in the Hotel Vancouver to hear a report from the Committee on Economics. A Brief known as the Twenty Principles of Health Insurance was presented. These represent the work of many months and embody the convictions of the British Columbia medical profession. It is hoped to publish this Brief in the Bulletin at an early date.

New Brunswick Division

The spring meeting of the Executive Committee of the New Brunswick Medical Society was held in Saint John, April 21. The president, Dr. H. S. Everett, of Saint Stephen, was chairman. Plans for the annual meeting of the society were reported upon. The Saint Croix Medical Society will be hosts to the doctors of the province at Saint Stephen on July 11 and 12. A good scientific program is certain and the business sessions will discuss Workmen's Compensation schedules, the proposed schedules of Dependents' Allowance Trustees, and receive a report on the progress of Health Insurance Legislation.

Medical Societies

No. 1 Canadian Division Medical Society

[*The following letter introduces the first report we have received of a Canadian Medical Society meeting in Italy.*—EDITOR.]

General Secretary,
Canadian Medical Association,

Dear Dr. Routley,

Just prior to the last meeting of our Divisional Medical Society we received the wealth of literature on the various health schemes in Canada which you had so kindly sent to us. The copies of the draft bill for National Contributory Health Insurance have been widely circulated, as have copies of the *Canadian Medical Association Journal* containing relevant articles. Charlotte Whitton's "Dawn of Ampler Life" was most interesting.

I am enclosing minutes of our last meeting which will indicate that we are still most concerned with future medical practice in Canada. Unfortunately for us, our recently elected President, Lt.-Col. (now A./Col.), W. J. Boyd, has left us to return to Canada on other duties, but a committee has been formed to continue the investigation of medical opinion in the Division.

We are very grateful for your help so far, and certainly appreciate all you have done for us. Here in Italy, medical literature of any kind has been scarce as several libraries were lost at sea; the *Canadian Medical Association Journal* has been one of our chief standbys.

Very sincerely,

I. S. MACLEAN, MAJOR.
(C. H. PLAYFAIR), COLONEL,
A.D.M.S., No. 1 Cdn. Div.

March 17, 1944.

A special meeting of No. 1 Canadian Division Medical Society was held on February 29, 1944, at the M.D.S. of a Canadian Field Ambulance in an Italian town. The following members were present: Colonel C. H. Playfair; Lieutenant-Colonels W. J. Boyd, J. A. Noble and W. E. Mace; Majors M. Carleton, D. A. Young, G. W. Wood, H. F. Frank, P. A. Scott, J. U. Coleman, A. M. Doyle, J. K. Bell, P. K. Tisdale, W. B. Hoggarth, E. A. Anderson and I. S. Maclean; Captains H. E. Foster, L. C. Steindel, G. H. Midgley, N. L. Walker, M. B. Secter, A. L. Jacobs, C. A. Myers, M. W. C. Feeney, T. Statten, H. R. Giberson, D. J. Hastings, H. Eshoo, J. P. McManus, C. G. McKinnon, R. R. Lewis, J. M. Heller, R. A. McIntosh, E. J. Cloutier, I. L. Lazareck, W. Fowler, J. C. Poole, D. G. Cameron, J. C. Bowes and W. H. White.

The A.D.M.S. opened the meeting by welcoming any new members to the Society and the guests who had been able to come. He then spoke to the members on the incidence of sickness in the division. He stated that the incidence of most conditions was comparable to that in other formations, with the exception of skin diseases. This was mainly due to lack of bath parades, and there was no cause for this with the equipment that was available in the division. He said that the condition was possibly due to two reasons, first the present situation in which the division found itself, and second, due to lack of washing amongst the men. Frequent bath parades should be arranged by unit officers. He asked the medical officers to check the cleanliness of the units from time to time.

At the last meeting, he stated, a nominating committee had been set up to produce nominees for the committee to run the society for another year. The following had been chosen and were unanimously elected: *President* — Lieutenant-Colonel W. J. Boyd; *Secretary*—Major I. S. Maclean; *in charge of programs*—Major H. F. Frank.

Colonel Playfair then introduced Captain Steindel, who had been visiting the Cotugna Typhus Hospital in Naples and asked him to give some of the facts he had gleaned there, to the members. Captain Steindel gave a brief history of the outbreak of typhus in the Naples area, and some figures. He said there had been 1,300 cases reported but only 700 of them confirmed. The death rate was 13%. The main symptoms were similar to those stated in the textbook, but one certain sign was the flush which came in the early stages. High temperature appears after three days, and the rash appears on the 5th day. Most of the cases seen had reached the rash stage. Gangrene may be present on the more dependent parts of the body (*i.e.*, finger and toe tips and tip of the nose). Deafness seems to be an important feature. A bedside test gave results in ten minutes, but neither this nor the Weil-Felix test show positive until the 5th or 6th day of the disease. He stated that the early toxicity of the patient was enough to make one suspicious of typhus.

Questions were put to Capt. Steindel. His paper was very well received by all members. Major M. Carleton, who had also visited this hospital, made a few remarks in regard to the anti-louse technique used on orderlies and visitors.

Then Colonel Playfair spoke on the actual purpose of the meeting, which was the discussion of the National Health Scheme. He spoke of the importance of this scheme in relation to the medical profession and to the medical officers themselves. Then he introduced Major Carleton.

Major Carleton said that he was there to introduce the National Health Scheme to the members of the Society. He spoke of the formation of the C.M.A., its principles, and its purpose. That the C.M.A. had given much time and thought to the national medical set-up for post-war years. Also, in the United Kingdom the Canadian medical officers of the Canadian Army

had formed committees and discussed the subject, and had formed an opinion which they had submitted to the C.M.A. in Canada. Their opinion was based on the twenty principles that the C.M.A. had sent overseas for discussion and which were agreed to, except where modified by certain additions of their own. The committee of the R.C.A.M.C. (Overseas) expressed complete confidence in the Canadian Medical Association as their representative, but had sent Lieutenant-Colonel E. A. Botterell of No. 1 Canadian Neurological Hospital, back to Canada to lay their views before the Association.

Major A. M. Doyle then took the floor to outline briefly the twenty principles to the meeting, stating that he had picked what he thought were the main facts from the paper, but could not give too much detail owing to the limited time. He went on to say that the National Health Scheme, which was part of the Social Security Act for Canada, constituted two Acts, the Enabling Act and the Provincial Act. He then explained briefly the purpose of both Acts. He also stressed the point that it would be in the interest of every person to become a member of the Canadian Medical Association. He explained that if the scheme were passed it would probably take two years for it to start operating. The scheme was such that it guaranteed all possible medical care to all people in Canada.

As a result of Major Carleton's and Major Doyle's talks, it was resolved that a committee of five members be formed to discuss the Medical Scheme and present their views to the Society for concurrence or otherwise, and forward to C.M.A. (Overseas) for consideration. If they found no change in the twenty principles that were laid out, at least they should send word to the C.M.A. of their approval.

The A.D.M.S., Col. C. H. Playfair, then turned over the chair to Lt.-Col. W. J. Boyd, the newly elected president for the coming year. Lt.-Col. Boyd made a short speech, thanking the Society for the honour, and hoped that in the coming year more meetings could be arranged. He also hoped that he would not have to serve his full term as president, which meant that he hoped the cessation of hostilities would end during his term.

There being no other business to discuss, the meeting was adjourned and tea was served to all members.

IAN S. MACLEAN, MAJOR,
Secretary, No. 1 Canadian Division Medical Society.

Oto-Laryngology Society of Cuba

(The Secretary of this Society, Dr. A. Codinach, sends us the following notice.)

I have very great pleasure in sending you cordial greetings in the name of the President, Dr. Pedro Hernandez Gonzalo, and at the same time I am pleased to inform you of the installation of the new Board of Directors which will direct the affairs of the Society of Oto-Laryngology of Cuba during the year 1944-45.

President—Dr. Pedro Hernandez Gonzalo; *Vice-president*—Dr. Reinaldo de Villiers; *Secretary*—Dr. Abelardo Codinach; *Treasurer*—Dr. Roberto Machado; *Committee*—Dr. Rene Revuelta and Dr. Ramon Hernandez Hechavarria.

La société médicale des hôpitaux universitaires de Québec

Une séance de cette société eut lieu a l'Hôpital Laval, Québec, le 14 avril, 1944. Suivent les résumés des travaux présentés.

CONSIDERATIONS SUR LES TUBERCULOSES MILIAIRES AIGUES. — R. Desmeules, J. Rousseau et Ph. Richard.

Les techniques histologiques modernes démontrent que les tuberculoses miliaires aiguës aboutissent finalement à la constitution d'une broncho-alvéolite. L'étude de 41 granulies observées à l'Hôpital Laval démontre que la maladie est plus fréquente chez la femme (12-16), qu'elle survient surtout de 11 à 20 ans (22-41), sans affecter davantage le campagnard ou le citadin (21-20). Les auteurs observent une granulie consécutive à un érythème noueux, un essaimage miliaire avec latence pulmonaire, une vomique ante-mortem due à un évidement ganglionnaire dans une bronche, deux localisations pharyngo-laryngées au stade pré-radiologique, 4 métastases de foyers osseux ou génito-urinaires. Onze des 31 malades ont fait une méningite bacillaire. Quatre avaient des localisations pleurales antérieures.

La radiographie a extériorisé 21 images micronodulaires exclusivement parenchymateuses, 15 avec des localisations pleurales et 5 avec des foyers de surinfection. Le bacille de Koch fut mis en évidence 27 fois soit dans les expectorations soit dans le liquide gastrique. Ces résultats établissent la preuve bactériologique que la tuberculose miliaire est ouverte. Le hémo-cultures ont été positives une seule fois sur 14 essais effectués tant sur le cobaye que sur des milieux hautement électifs. (Loewenstein). La sédimentation globulaire a donné des réponses très variables et nullement en rapport avec le degré d'activité des lésions. Les 9 autopsies ont révélé l'intégrité du pancréas et du myocarde au cours du processus miliaire.

La maladie granuleuse nous apparaît comme la manifestation brutale d'un essaimage bacillaire hématogène chez un anergique, ou comme le résultat d'un fléchissement de l'état allergique ou comme la phase terminale d'une tuberculose de surinfection.

LA TUBERCULOSE MILIAIRE PHARYNGO-LARYNGÉE MALADIE D'ISAMBERT).—G. Léo Côté.

L'auteur, à l'aide de deux observations personnelles, étudie la question assez peu connue de la tuberculose miliaire pharyngo-laryngée ou maladie d'Isambert. Cette affection n'est pas une rareté clinique, puisqu'elle est apparue comme manifestation locale au cours d'une granulie généralement pleuro-pulmonaire dans 10% des cas environ, d'après les statistiques de l'Hôpital Laval. Deux grands symptômes ont paru dominer le tableau clinique de la maladie d'Isambert: la dysphagie marquée, rapidement très atroce, peu soulagée par nos moyens actuels de thérapeutique, et l'asthénie avec amaigrissement conduisant rapidement vers un état de cachexie complet.

L'auteur rappelle ensuite la difficulté du diagnostic, tout au moins au début de la granulie, alors que les signes fonctionnels, sthétacoustiques et même radiologiques attirent peu l'attention. L'apparition d'une granulie pharyngo-laryngée permettra alors de poser un diagnostic qui sera bientôt confirmé par l'apparition

de l'aspect granité caractéristique. Il rappelle enfin que la maladie d'Isambert est une granulie aiguë à évolution fatale. Comme telle elle n'est pas justifiable d'aucun des traitements actifs de la tuberculose laryngée ordinaire. Ce n'est pas à dire cependant, qu'il faille abandonner les malades à leur triste sort sans rien faire. La médication, où entrent à volonté l'opium et ses dérivés, n'est que palliative et n'empêche en aucune façon l'issue fatale; elle est sans grande action sur la maladie elle-même, mais elle doit être employée jusqu'à la fin, étant d'une grand secours sur l'état moral du malade.

TUBERCULOSE MILIAIRE SUBAIGUE ET CHRONIQUE.—R. Desmeules et P. Richard.

Les auteurs rapportent deux observations de tuberculose miliaire à évolution lente. Un des malades est décédé après l'évolution prolongée de la granulie. L'autre a cliniquement et radiographiquement guéri de la tuberculose miliaire torpide. Un foyer de tuberculose commune a suivi la granulie chronique.

Nous savons que l'apparition de granulations tuberculeuses dans les poumons n'est pas incompatible avec la persistance d'un état général satisfaisant ni avec la présence de signes physiques et fonctionnels discrets. La fièvre peut être absente ou intermittente et peu élevée. La dyspnée est plus ou moins marquée. En vérité, sans l'aide de la radiographie, le diagnostic de tuberculose miliaire ne pourrait être porté.

L'évolution des granulies torpides peut se faire de trois façons. Parfois, il y a disparition complète des opacités micro-nodulaires. En d'autres cas, il y a transformation en tuberculose commune. Enfin on peut assister à une terminaison fatale, par transformation de la forme lente en forme rapide ou encore par l'apparition de méningite tuberculeuse.

Retenons que la guérison est loin d'être la règle et que le diagnostic de tuberculose miliaire subaiguë ou chronique impose un pronostic très réservé.

CONSIDÉRATIONS SUR QUELQUES BRONCHIECTASIES DU SOMMET.—Louis Rousseau.

Les bronchiectasis du sommet sont souvent confondues avec la tuberculose. Leur symptomatologie est souvent pauvre et les radiographies donnent des images rappelant celles de tuberculoses pulmonaires fibreuses. Ces bronchiectasis peuvent être d'origine tuberculeuse ou non. Si elles ne le sont pas, une tuberculose peut se greffer sur ces dilatations. On a prétendu que les dilatations de la base seraient le plus souvent non tuberculeuses alors que celles du sommet reconnaitraient cette origine dans la majorité des cas.

Sur trois observations de bronchiectasies du sommet, deux ont montré la présence de bacilles de Koch, tandis qu'une no fournit aucune preuve bactériologique de son origine tuberculeuse. Dans les trois cas, la tuberculose n'a aucun caractére évolutif et est reléguée au second plan par le syndrôme bronchiectasique. L'évolution de la tuberculose ne semble pas sérieusement affectée par les dilatations bronchiques minimes tandis que les dilatations consécutives à une sténose bronchique aggravent toujours le pronostic de la tuberculose.

The Upper Island Medical Association, British Columbia

The Upper Island Medical Association held its spring meeting at the Ben Bow Inn, Qualicum Beach, B.C., on May 4. In the absence of Major S. L. Williams, R.C.A.M.C. who is president of the association, the vice-president, Dr. E. D. Emery, of Nanaimo, presided. Dr. C. C. Browne is the energetic secretary and is responsible for keeping the association very active.

The speaker of the evening, following an excellent dinner, was Dr. P. L. Straith, of Courtenay, who dealt with Gall Bladder Disease. Dr. M. W. Thomas, Executive Secretary of the College of Physicians and Surgeons, was present and discussed with the members certain live topics of interest at this time and answered a number of questions.

Those present included, Drs. G. K. MacNaughton, Cumberland, P. L. Straith and T. G. Briggs, Courtenay, Surg.-Lieut. Arbour, R.C.N.V.R., Drs. E. N. East, Qualicum, R. W. Garner, G. B. Helem, A. P. Miller, W. C. Pitts, of Port Alberni, Capt. N. H. Jones, R.C.A.M.C., formerly of Port Alberni, Drs. C. C. Browne, A. B. Hall, E. D. Emery, A. H. Meneely, of Nanaimo, H. G. Garrioch, of North Battleford, Sask., who was visiting Dr. Meneely and M. W. Thomas.

Essex County Medical Society

The Essex County Medical Society gave a complimentary dinner on May 3 in Windsor to two of its members who have achieved distinction during the past year. Dr. Brockenshire is president of the Ontario Medical Society and Dr. Sanborn has just completed his term of office as president of the College of Physicians and Surgeons of Ontario.

Saint John Medical Society

Dr. Arnold Branch, acting Director of the New Brunswick Provincial Laboratories was the guest speaker at the monthly meeting of the Saint John Medical Society on April 27. His subject "The interpretation of serological and other laboratory tests" was appreciated by the good audience, because such a discussion by an expert provided an opportunity to show how laboratory tests should be evaluated and to demonstrate how to best use the laboratory to aid in diagnosis and treatment of disease.

Correspondence

The Royal College Examinations

To the Editor:

A non-member of the Royal Colleges is hardly justified in commenting unfavourably on their present system of examinations without special reasons; but I have two. In the first place, any member of a department of anatomy in a Canadian medical school is continually asked for advice and for the provision of study facilities for the primaries. Secondly, any member of the profession, and especially those concerned with medical education, should be interested in the development of postgraduate opportunities in Canada. As a result of these two interests,

I would like to offer some criticisms and suggestions.

The present policy of primary and final examinations seems to me to be unsound. It sets up a group of preclinical teachers as the final arbiters of a man's chances to obtain what is really a clinical qualification. No one can gainsay that a sound grounding in the preclinical sciences is of fundamental value to a clinician, and furthermore, it must be admitted that the examiners in the primaries have preserved a good sense of proportion. Yet it is hardly right that they alone, without the concurrence of men who are actually in practice, should determine whether a candidate should be stopped in his efforts to obtain an advanced clinical standing.

A still more serious objection is that the double sets of examinations place a great obstacle before many worthy young men, in that they make it necessary for him in preparing for them to drop his practice for some time on two different occasions, and such a course may impose a real economic strain on a young doctor who has family responsibilities to shoulder and accumulated debts to discharge. He has to consider seriously whether he can afford to take the chance, especially in the primary, where, in the event of failure, his clinical knowledge has benefited him only indirectly.

In answer to this it is often said that the primaries should be written while the candidate is an undergraduate. This is certainly not advisable. Aside from the disruption it causes in a student's sessional studies during the October examinations, the real value of the review of the basic sciences comes from revising them in the light of clinical experience. There is a good historical reason, which it is hardly necessary to go into here, for the institution by the Royal College of England of separate primary examinations, open to undergraduates, but it is of interest to note that, as reported in this *Journal* in September (1943, **49**: 250), the F.R.C.S. regulations in England have been changed. Undergraduates are now barred from the primaries, and, even more important, a candidate who passes the primary may proceed immediately to the finals. This latter change may lead to the eventual consolidation of the two sets of examinations.

My suggestion is that the Canadian Royal Colleges have a single series of examinations, combining the primaries and finals. Such a course would appear to me to have many advantages. The association of preclinical teachers with clinicians would be to the profit of both, and it would also be fairer to the candidate. A young man would feel more justified in sacrificing sufficient time and money to work for such a combined examination. If he failed he would still have gained far more as a practitioner than if he had tried and failed the primaries alone.

There is, however, another consideration in that it may have a salutary effect on systems of postgraduate education in Canada. It is possible that under a scheme of combined examinations many of the Canadian medical schools would be stimulated to set up adequate courses to prepare candidates for the examination, superseding the present hit-or-miss arrangements. Without disparaging the great value of individual enterprise, the "self-help", or "fifteen minutes a day" technique has its limitations in medicine, and in the conditions of medical practice. Also private tutorial classes might, with advantage to all concerned, give place to the more regular and wider based courses that could be given by teaching institutions. Under such auspices, the combined examination would perhaps lead to the inception of well integrated and correlated courses in which all departments of a medical faculty could play a part. Such a course, with the chance of gaining the qualification of the Royal College, and, even though failing that, the assurance of increased clinical knowledge and skill, would likely attract men in sufficient numbers, and willing enough to pay adequate fees, that the cost to the institution could be met, at least to a large extent.

Finally, the men in the services, at present deeply concerned with their post-war prospects, would, I think, welcome either or both of the above suggestions. Many of them will be able and willing to earn for themselves higher qualifications, but the time necessary for qualifying under the present dual examination system, and the question of available facilities will be serious problems.

But now let the anatomist retire to his cadaver and cell, rather amazed at his temerity in offering advice to a Royal College, but able to feel his mind somewhat relieved on the next occasion when the usual visitor, with the customary rising inflection greets him with "I'm thinking of writing the F.R.C.S.".

H. E. RAWLINSON,
Associate Professor of Anatomy,
University of Alberta.

April 19, 1944.

Special Correspondence

The London Letter

(From our own correspondent)

THE NATIONAL HEALTH SERVICE

This continues to be one of the main topics of medical interest. The Minister of Health recently dealt with what he termed "two utterly mistaken ideas" and attempted to answer some of the current criticisms.

The first concerns professional freedom and he has categorically stated that this should not be impaired. The second criticism to be answered concerns the voluntary hospitals. Since the Government have announced that they are not

proposing to pay the whole cost of the services rendered, there has been quite a lot of protest; but the Minister's answer is to the effect that if the whole cost is being paid, then the whole question of voluntary status would have to go. It is not quite clear yet whether this argument is completely valid and it is intimately bound up with the financial aspects of the Health Service as a whole.

With regard to this aspect, there has been a most interesting and reasoned criticism which suggests that either financial estimates have been prepared by someone peculiarly uninformed or else the Government intends to provide a cheap and indifferent service. Instead of £148,000,000, this critic works out his figure in detail to come to something nearer £200,000,000. He points out that on the present basis, the amount of payment for doctors will not give an adequate average and also that the amount allowed per hospital bed per week is highly inadequate and leaves nothing to pay for the proposed consultant services.

Otherwise, there is nothing fresh to report and it is presumed that the Government will begin to consult various parties in the near future.

THE NATION'S HEALTH

One of the difficulties in connection with the proposed new service is that without it we have become a healthier nation, and the fact that this point is constantly being emphasized by officials of the Ministry of Health, only adds to the misgivings of many practitioners. For example, the provisional infantile mortality rate for 1943 is put at 50, which is another new record. The provisional death rate for the whole of 1943 was 12.1, and but for the influenza outbreak at the end of 1943 it would have been even lower. Moreover, this influenza outbreak although relatively serious, did not continue for very long and was more or less over in one main wave, a point which suggests that the resistance of the population is good for wartime.

Another notable feature of health in 1943 is a record low level for deaths from diphtheria which provisionally are put at 30% lower than in 1942. This is undoubtedly due to the great efforts which have been made to get children immunized.

MORE ABOUT FOOD

At the end of last year some mention was made of the efforts of the authorities of the King Edward's Hospital Fund for London to do something about hospital diet. In a memorandum it was laid down as fundamental that the food service should be regarded as one of the essential remedial services offered by the hospitals. This has hitherto been very far from the case and, in fact, in general terms, hospital diets have been a scandal. This has been particularly due to the erroneous ideas of economy as a test of efficiency but, also to the fact that the nursing staff and others, with no knowledge of dietetics, have controlled food policy. Now things are moving and not only has the King's Fund made available an expert to advise hospitals who ask for it, but the Ministry of Health has appointed two women dietitians of its own.

There is another point which needs consideration, namely, that in order to teach people what to eat, it is a good thing to give them samples, and a stay in hospital might well be used as an excellent opportunity. Even for out-patients, the services of a good canteen and a dietitian to explain just what is happening, would also go a long way to improving national knowledge of nutrition.

TREATMENT OF CRIME

There have been many developments in this subject in the past hundred years or so and there are still more advances for the future which thoroughly justify the title of "treatment". The Home Secretary is setting up an Advisory Council to draw up a program of reforms in accordance with the management of all categories of prisoners, and in particular no doubt the committee will deal with the young delinquent. This matter, of course, was much to the fore last year when a certain juvenile court came in for much publicity and there is quite a lot of scope for changes in this direction.

Where the medical profession comes in is not only to help in such matters as scientific diagnosis, and in particular the psychological aspects of the subject, but also to draw attention to what may be called the social medicine side of the problem. Environment and the home background do certainly play just as important a part in the production of delinquency as for example in the bed-wetter or other form of nervous disability in childhood. The indifference with regard to all this, by particularly the older type of magistrate, means that all chances of constructive work are missed and the Courts continue to be merely penal institutes. "More doctors on the Bench", would be a good slogan.

ALAN MONCRIEFF

London, May, 1944.

W. Stuart Thomson (Edinburgh) writes: Referring to the answer to a question on halitosis in your issue of January 29 (p. 172) I venture to suggest that the connection between halitosis and the alimentary canal distal to the pharynx is not sufficiently stressed. Surely we are all aware of cases of a temporary halitosis accompanying (? due to) a temporary digestive disturbance. Why should not chronic indigestion, constipation, colitis, etc., be accompanied by fetor oris in a similar manner? Might I also suggest that once a sensitive type of person is aware of having a fetor oris it tends to be accentuated or perpetuated by the mental factor.—*Brit. M. J.*, 1944, 1: 348.

Canadian Medical War Services

MEDICAL OFFICERS APPOINTED TO THE R.C.A.M.C. — ACTIVE FORCE MARCH, 1944

(Previous sections appeared in the February, March, May, July, September, November and December 1943, and January, February, March and May 1944, issues)

SECTION XXIV

Name	Address	Date of Appointment
Anderson, R. C.,	Canadian Army Overseas	21-1-44
Janowsky, S.,	Victoria, B.C.	15-3-44
Mosbaugh, M. M.,	Toronto	7-2-44
Phillips-Wolley, C. J. F.,	Montreal	17-2-44
Stanford, R. L.,	Montreal	22-2-44
Van Horne, J. R.,	Yarmouth, N.S.	16-2-44

MEDICAL OFFICERS STRUCK OFF STRENGTH OF THE R.C.A.M.C.—ACTIVE FORCE MARCH, 1944

Name	Address	Date struck off strength
Aberhart, C.,	Toronto	15-2-44
Davidson, A. M.,	Winnipeg	1-3-44
Dube, J. A.,	Lake Megantic, P.Q.	17-2-44
Gauvreau, L.,	Quebec	29-12-43
Hill, L. R.,	Toronto	3-2-44
Johanson, A. N.,	Lethbridge, Alta.	16-2-44
MacKinnon, N. E.,	Downsview	18-2-44
Malcolm, G. G.,	Ottawa	11-2-44
Ross, J. R.,	Toronto	26-2-44
Salter, A. W.,	Wynward, Sask.	27-5-43
Singleton, A. H.,	Rouleau, Sask.	14-5-43
Stone, E. L.,	Ottawa	19-1-44
White, A. W. M.,	Toronto	28-2-44
Wilson, G. M.,	Revelstoke, B.C.	1-3-44

University Notes

McGill University

At a meeting of the Senate of McGill University in April it was decided to terminate the acceleration program in medical and dental teaching which has been in force for the last two years. This decision to resume the peacetime program in teaching was made in accordance with a recommendation by the Association of Medical Colleges of Canada and with the approval of the Department of National Defence. Students in the upper years in both medicine and dentistry who have already entered upon the accelerated course will continue under that system.

University of Manitoba

Starting with the academic year which will open next fall, the medical course of the University of Manitoba will revert to the former five-year term, and the accelerated wartime courses adopted two years ago at the request of the Dominion Government will be discontinued.

Three racial groups, Jewish, Ukrainian and Polish, have made representations to the Board of Governors of the University of Manitoba for an open faculty of medicine as a logical step to remove alleged discrimination in the admission of students to the medical school. Drs. B. Dyma and H. E. Gowron spoke on behalf of the Ukrainian group before the Board of Governors and Dr. F. A. Rybak appeared for the Polish group. Both groups contended that slight changes in facilities at the University might enable the faculty to care for a larger group of students.

University of Toronto

The following medals, scholarships and prizes have been awarded by the Senate of the University of Toronto, May, 1944: The Cody Gold Medal—G. L. Snider; The Cody Silver Medal—W. T. W. Clarke and W. J. Horsey; The William John Hendry Memorial Scholarship in Obstetrics and Gynæcology—C. Alter; The Chappell Prize in Clinical Surgery—W. J. Horsey; The Ontario Medical Association Prize in Hygiene and Preventive Medicine—D. Fraser; The David Dunlap Memorial Scholarships: Sixth Year—W. T. W. Clarke; Fifth Year—H. Kalant; Dr. Roy Simpson Scholarship in Pædiatrics—C. T. Collins-Williams.

Miscellany

MR. CHURCHILL WITH THE PHYSICIANS

[The following account is abstracted from "The Lancet", March 11, 1944. The occasion was a luncheon at the Savoy Hotel given on March 2 by The Royal College of Physicians of London, when Lord Moran, the President, proposed the health of the guests and Mr. Churchill replied with a toast to "The College".

—EDITOR.]

LORD MORAN'S SPEECH (IN PART)

The foundation of the Royal College of Physicians by Henry VIII in 1518 created medicine as a profession. Henry in his high Tudor tones decreed in his Charter that "no person from henceforth be suffered to exercise or practise in physic through England until such time as he be examined at London by the said President and three of the said Elects." The Stuarts were as favourably disposed to the College as the Tudors had been and an appeal on technical grounds against the College was summarily dismissed by the Lord Chief Justice who thereupon was entertained by the College to dinner in recognition of his fairness and impartiality. For three and a half centuries the College was consulted by the Crown on all sorts of occasions. There was no County Council, no local government, no Ministry of Health, there was no other body between the Government and the profession—the College was a pillar of the State.

HIS PREDECESSORS

The annals of the College have been kept from its earliest days and they testify to the independence of my predecessors. William III summoned Dr. Radcliffe, whose name is still honoured in Oxford, and showed him his great dropsical legs beneath his wasted frame. "What make of you these?" he demanded, "Truly, sir", Radcliffe answered, "I would not have Your Majesty's two legs for all your three Kingdoms," after which freedom the King did not trouble Dr. Radcliffe again for his opinion. But when Anne came to the Throne she summoned Dr. Radcliffe and presently we find him sending her word that her ailments were nothing but the vapours so that he refused to see her. The mob, hearing of his action, were greatly incensed and for some time he went about in fear of his life. Seventeen years later, in 1722, Friend—a fellow of the College—was imprisoned in the Tower for his religious conviction and Dr. Meade, who was then looking after Robert Walpole, the Prime Minister, refused to prescribe for him until Friend was set at liberty, which was done. I sometimes think rather wistfully of Dr. Meade's procedure. I suspect that the Prime Minister in the course of his devotion to the classics at Harrow, of which he has told us, came under the influence of Marcus Aurelius. The Emperor had plainly been very badly brought up by his doctor, Galen, for he said "If you are sick don't give doctors a chance to make an ado, but let life go on merrily and well."

PROFESSIONS COMPARED

It is perhaps inevitable that having spent so many hours in the ante-chamber of Councils of War I have come to compare the profession of medicine and the profession of arms. Progress in both professions has always come by jumps punctuated by long periods of stagnation. Before the discovery of anæsthetics surgery was confined to a few operations carried out at great speed while the victim was forcibly held down: for centuries the barber surgeon was content to cut for stone, then at a stroke the use of chloroform and ether opened the whole body to the surgeon's knife. Likewise, in the soldier's craft, after a great stretch of time during which the subaltern was brought up on the campaigns of the great captains, there came the liberating moment when the appearance of the internal combustion engine, comparable to the discovery of anæsthetics, quite altered war.

In comparing the professions one asks whether the same qualities are needed in both. For some years now I have come much into contact with soldiers and as a doctor I see no reason to believe that the scientific mind is more common in my calling than in the Army. At any rate that is true if I am speaking of practising physicians and surgeons. I hasten to add that qualification, for there are half a dozen creative minds in the profession of medicine who have no counterpart in the army—Sherrington, Adrian, Dale, Gowland Hopkins, Thomas Lewis, Almroth Wright, all fellows of our College. There is, too, no machinery in that service like the Medical Research Council for the discovery of men with the creative instinct at the outset of their careers. Such men would carry out research into tactics and weapons—for example, the limitations of the anti-tank rifle would have been laid down before it was used in battle. But I am not sure if the conditions of the two professions are strictly comparable. I doubt whether the direction of armies in war calls for the creative instinct in the same measure as does research into the origin of disease. And these doubts are strengthened by a conversation with General Smuts at Cairo in the summer of 1942. I had been talking to him of the appraising, measuring mind, of the value of judgment. He accepted this but went on to speak of the supremacy of the man of ideas. "Men of action", he said, "live on the surface of things, they do not create". Smuts, if he had been born in Germany, might have been one of the great captains of war. He collects his facts like a man of science—listening, sifting, rejecting what has not been proved. No other soldier that I know has quite the same approach to evidence.

There is one other qualification I must make. I am bound to ask if the conditions of the soldier's life and training are friendly to the development of the scientific mind. Discipline does not foster independence of thought, while life in a regimental mess hardly encourages these habits of reflexion that are only bred in solitude. Further, there is the fetish, not confined to soldiers, that the mind works best when the body is exhausted by exercise.

STAYING POWER

There is one quality which both callings need. The first and the last essential of an efficient soldier is character; without it he will not long endure the perils of modern war. Even in the last war the durability of a general—his survival value—seemed to depend more on character than on capacity. We may doubt the pre-eminence of Foch, Haig, Jellicoe and Trenchard in their art, but as men they came from the old mould of their race. They wore well, they were built for great occasions. In the fundamental clash between great nations, when their existence is at stake, the issue is determined by moral and not by intellectual factors. The part that character plays in medical diagnosis is not always appreciated. It is the quality which allows judgment to be exercised irrespective of worldly considerations which may snare the feet of the lighter breed of doctor.

I end my comparison with a paradox. The successful doctor sees a stranger almost every hour of the day and he must not only find out what is wrong with him but must learn to gauge his temperament and his outlook, what he wants to know and whether he is going to do what you tell him; and so the physician after 30 or 40 years becomes an expert judge of men. But he cannot use it in devoluting his work. He must exercise his lonely art as an individual. Now the soldier who has not the art of selecting his subordinates is lost, but it is the paradox of the situation that, unlike the physician, he gets few opportunities in peace-time of practising this art. Even individual criticism is discouraged in the mess.

THE SECRET OF LEADERSHIP

Aristotle believed that a physician had opportunities of studying human nature given to no one else; a philosopher, he said, ought to begin life as a physician, and a physician should end his life as a philosopher. I shall not make use of what I have learnt in welcoming our guests in turn, but I want to say a few words about the first of our guests, the Prime Minister. I shall not go over again those of his virtues which have caught the breath of the world, but I shall try to measure his contribution to victory by attempting to define more precisely than has been done the exact nature of his task. That task as I see it is the moral preparation of the youth of England for ordeal by battle. "If these English had any apprehension they would run away"; that was what Shakespeare said of our soldiers at Agincourt. Five centuries have passed and the insensitive straw-chewing yokel soldier has gradually changed into the imaginative citizen soldier of the democratic armies of today. It was of this man Thomas Hardy wrote "More life trickles out through a man's thoughts than through a gaping wound". This is the problem that confronts the leader of a democracy. If he can find no solution he sends his armies limping into war.

He cannot solve his problem in the way our enemies do. The German soldier is stiffened by a pride in arms; when he joins the army he joins a sacred fellowship, he is envied by his fellows. The Guards and the Navy have this pride in arms, but it cannot be transferred to a citizen army in a few months' training. How then can it be done? That is a story for another day. But perhaps I may say this: the art of command is the art of impressing the imagination. When the surge and thunder of the Prime Minister's vast vocabulary are heard no more, history will recount how he spread abroad a sense of purpose and direction which gave men hope, when there was really none. More than once I have been with him when news of shattering reverses was brought to him and in my heart I have come to think of him as invincible.

I see President Roosevelt singing carols on Christmas Day, care-free as a boy; I see Stalin drawing wolves with a fat red pencil while he listens to the English case; but this is the picture I would like to leave with you of the Prime Minister. A battalion of the Coldstreams was drilling before him and as he watched the perfect rhythm of their movements his eyes filled with tears. If you can understand that surge of feeling, can feel what he felt, you have got to the heart of the making of soldiers and it was his success in this making of soldiers and sailors and airmen which has stood between us and the utter ruin of our cause through all these anxious years.

MR. CHURCHILL SAID:

I am very grateful to my cherished friend, Lord Moran, for the kind expressions he has used about me and about the conclusions which his naturally close and intimate investigations have enabled him to form (*Laughter*). He has been my companion on the various journeys I have had to take in the course of public business about the world during this war, and always a devoted and comforting friend. We get on very well together (*Laughter*). As you can see from the excellent speech to which you have just listened, we divide our labours; he instructs me in the art of public speaking, and I teach him how to cure pneumonia (*Laughter*). But close as our relations are, I must confess that it was not without compunction and even misgiving that I accepted his hospitable invitation today.

I do not profess to be very deeply acquainted with the science of medicine. I am a surgeon myself (*Laughter*). But my experiences in medicine have been vivid and violent, and completely absorbing while they were going on (*Laughter*). Nevertheless, I cannot claim that they have given me that broad detached general experience which, I believe, is the foundation of all correct scientific action. Moreover, to address so distinguished a company on topics with which one is necessarily not profoundly acquainted is an ordeal. But the most serious part of my misgivings arose from the fact that I should have to leave my patient for a while. I have a patient whom I have been looking after for some years, as you may know, and I am glad to be able to assure you that she is no longer in mortal danger (*Applause*); on that I can give you an absolute assurance. You must not suppose that this has in any way reduced my work; on the contrary, now that the greatest danger is passed, my patient has reached a stage where restiveness, fretfulness, the impatience of convalescence, the weariness of a long prolongation of the disease, while they do not excite the same anxiety in one's breast, nevertheless require a very full measure of one's personal attention (*Applause*).

The Government's Course

The recent advances in medicine are most remarkable and inspiring. Human inventiveness has been fanned by the fierce wings of war. New drugs of a remarkable, healing potency are becoming commonplaces of science, and even the latest textbooks on many diseases require to have very considerable annotations and additions made to them. I personally have never failed to pay my tribute of respect and gratitude to M & B; although I am not competent to give you an exact description of how it works, it certainly has in my case always been attended by highly beneficial results. Then, there is penicillin, which has broken upon the world just at a moment when human beings are being gashed, and torn, and poisoned by wounds on the field of war in enormous numbers, and when so many other diseases, hitherto insoluble, cry for treatment. It is a great satisfaction to be able to congratulate St. Mary's Hospital on their association with penicillin (*Applause*).

The discoveries of healing science must be the inheritance of all. That is clear. Disease must be attacked whether it occurs in the poorest or the richest man or woman, simply on the ground that it is the enemy; and it must be attacked just in the same way as the fire brigade will give its full assistance to the humble cottage as readily as it will give it to the most important mansion. H.M. Government have adopted the policy outlined in the remarks of Lord Beaconsfield (Health and the laws of health), and that is the course upon which we have embarked. Our policy is to create a National Health Service in order to ensure that everybody in the country, irrespective of means, age, sex or occupation, shall have equal opportunities to benefit from the best and most up-to-date medical and allied services available.

The plan that we have put forward is a very large-scale plan, and in ordinary times of peace would rivet and dominate the attention of the whole country, but even during this war it deserves the close study and thought of all who can spare themselves from other duties for that purpose. It is not a rigid or arbitrary plan. We welcome constructive criticism, we claim the loyal and active aid of the whole medical profession (*Applause*). Any health service must rest on two arches: the first, the General Practitioner, the rank and file of the profession; the second, the Hospital Service, depending upon the staffs of the hospitals, sustained and guided by the Consultants. The fact that many more consultants will be needed in the future than there are now must not result in dilution or in the lowering of the standard of consultant work. There is a new gap to be filled, and it is essential that in this new effort the Colleges should play their great part. We ask your aid. We invite your counsel. Together these vast problems may take a forward move which will be notable and permanent in its effects long after the roar of the cannonade has died away.

We have today announced the names of the Royal Commission on Population. There is no branch of human knowledge in which we can pierce the mysteries of the future so clearly as in the trend of population. Here you have prophecies which rest on certainty; here the searchlight of statistics ranges with accuracy for thirty or forty years ahead. The destiny of our country, which after all has rendered notable services to mankind in peace and, latterly, in war, depends upon an ever flowing foundation of healthy children, born into what we trust will be a broader society and a less distracted world. Science, now so largely perverted to destruction, must raise its glittering shield not only over the children but over the mothers, not only over the family but over the home. In all this field again you must be active. Your services will be given with devotion, and your voice will be heard with respect.

In Praise of Tradition

This College, on whose past you, Lord Moran, have descanted, on whose past you have opened some windows which cast a view upon its former glories, was, I am assured, founded by a man of wide experience of human nature—and of both sexes (*Laughter*)—King Henry VIII, in 1518. It is claimed that he thus created medicine as a profession and cast a stern Tudor frown upon quackery of all kinds. However, my Lord, the Ministry of Health are of opinion that the suppression of quackery dates not from 1518 but from the Medical Act of 1858 (*Laughter*). I

would not for worlds plunge into a new controversy in a world which is already sufficiently filled with strife, but certainly this College was famous, and its career was remarkable, for many long periods of history, during some of which it has been a veritable pillar of the State. Certainly, if appeal is made to antiquity, the honours rest with the Royal College of Physicians. The Ministry of Health, I remember well, is quite a newcomer in the field, for I can recollect myself having at one time been offered by Mr. Asquith the Local Government Board—it sounds a very modest affair (*Laughter*)—carrying with it only a salary of £2,000 a year as a minor Minister, but which has now blossomed out quite recently into the full-blown majesty of the Ministry of Health.

As between the old and the new you have undoubtedly the advantage of antiquity. This College must play its part in keeping alive the historic tradition of the medical profession, and must ever foster those high standards of professional behaviour which distinguish a profession from a trade. This is what you have tried to do as an institution for nearly four hundred years. I confess myself to be a great admirer of tradition. The longer you can look back, the farther you can look forward. This is not a philosophical or political argument — any oculist will tell you this is true (*Laughter*). The wider the span, the longer the continuity, the greater is the sense of duty in individual men and women, each contributing their brief life's work to the preservation and progress of the land in which they live, of the society of which they are members, and the world of which they are the servants.

Abstracts from Current Literature

Medicine

Phenarsine Hydrochloride in the Treatment of Syphilis. Boardman, W. P. and Kaldeck, R.: *New Eng. J. Med.*, 1944, **230:** 12.

The use of phenarsine hydrochloride in the treatment of 112 cases of syphilis at the Boston City Hospital over a period of one and a half years is reviewed by the authors. The drug is a mechanical mixture of 3-amino-4-hydroxy-phenyl-dichlorarsine hydrochloride with sodium citrate as a buffer diluent (chlorarsen) and was administered in courses of ten to twenty injections in dosage of 0.03 to 0.045 gm. for women and 0.03 to 0.067 gm. for men, alternating with courses of fifteen injections of bismuth. Phenarsine and bismuth were never given simultaneously. Late cases began treatment with bismuth and pregnant women were treated with phenarsine alone.

Phenarsine was discontinued in five patients because of severe gastro-intestinal disturbances. One of these five developed an eruption and another jaundice and hypochromic anæmia. Mild reactions (headache, dizziness and nausea) occurred in 36% of cases of primary syphilis, 26% of the secondary and 18% of the patients with late syphilis. When reactions appeared phenarsine was continued in lower dosage with the addition of either 10 c.c. of 50% glucose or 10 c.c. of 10% sodium thiosulphate.

Serologic reversal to negative took place in 86% of the primary cases, 86% of the secondary and 9% of the late cases. The authors conclude that phenarsine compares favourably with mapharsen in regard to low toxicity and in its efficiency in causing reversal of serology. NORMAN S. SKINNER

Familial Syringomyelia. Mueller, C. R. and Sugar, L. J.: *J. Am. M. Ass.*, 1943, **122:** 743.

A family in which all 4 brothers were affected with this form of myelodysplasia, while the one sister remained normal, is reported. The mother's brother likewise had the disease. Two of her nephews were similarly affected. Unfortunately the report does not indicate whether these nephews were children of the mother's sister or of her affected brother. If the former, then the record suggests typical sex linked recessive inheritance: if the latter it is difficult to explain it on this basis unless the affected brother were married to a cousin. MADGE THURLOW MACKLIN

Studies in Acute Myocardial Infarction. 1. The Clinical Picture and Diagnosis. Baer, S. and Frankel, H.: *Ann. Int. Med.*, 1944, **20:** 108.

A series of 378 cases of acute myocardial infarction is presented. The incidence of males to females was 3:1. Myocardial infarction occurred at a later period in women, the average age for women being 61.6 years, for men 56.7 years. The immediate mortality roughly increased with advancing years, and was somewhat greater in women. Pain was reported in 90% of cases, dyspnœa in 76%, cyanosis in 46%. Temperature was elevated in 66% of cases and pulse above 100 in 47%. Hypertension and cardiac failure were much more frequent in the female than in the male. A friction rub was present in 12%. Fifty per cent of the patients were admitted with a diagnosis of acute myocardial infarction, and 20% had no diagnosis referable to the heart.

II. Laboratory Procedures as Diagnostic Aids.—A study was made of the value of laboratory procedures in the diagnosis of 378 cases of acute myocardial infarction. Of 274 patients, 74% had leucocytosis above 10,000 cu.mm. If seen at the optimum time, 95% or more should exhibit leucocytosis. In 180 patients 95% showed a rapid sedimentation rate. Blood-sugar determinations on 289 patients revealed hyperglycæmia in 94, and only 34 had previously known diabetes.

The electrocardiogram was diagnostic of acute infarction in 94% of 321 cases. S. R. TOWNSEND

Surgery

One Aspect of the Post-traumatic Syndrome in Cranio-cerebral Injuries. McKenzie, K. G.: *Surg., Gyn. & Obst.*, 1943, **77:** 631.

Concussion and more serious head injuries are more and more common. Standard teaching tells us to keep these patients quiet, and flat in bed, for prolonged periods if we are to avoid post-traumatic symptoms. Nevertheless, headache, dizziness, faintness and similar symptoms still occur with utmost frequency in patients who have been so injured and so managed.

The author proposes a new and opposite hypothesis which appears very reasonable. After concussion has occurred the vasomotor centre is injured and unstable. During its recovery it needs to accommodate itself to a horizontal vascular system if the patient is kept in bed. It becomes incapable of quickly supplying blood to the brain during changes of position, and this is the cause of the post-traumatic syndrome. Once established, the syndrome can be overcome in some cases by a course of exercises over several months. This involves stooping exercises and also forbids the patient ever to lie flat, day or night. He sleeps high on pillows.

On the basis of such experience the author began getting head injuries up within a few days so that early erect position would more quickly retrain the injured vasomotor system and prevent it becoming conditioned to the horizontal position.

The optimum time to prevent or cure headache, dizziness, mental and physical fatigue is during the first stay in hospital, not some months later. If this hypothesis is correct (and results based on it have been good) then many cases of post-traumatic syndrome have resulted to some extent from incorrect management, and this new aspect of a serious problem may be of great importance. J. R. LACROIX

Carcinoma of the Breast. II. Criteria of Operability. "Le cancer du sein. II. Critère d'opérabilité." Haagensen, C. D. et Stout, A. P.: *Ann. Surg.*, 1943, **118:** 859.

Les auteurs, à l'aide d'une série de 1,040 cas observés au Presbyterian Hospital de New-York, étudient dans cette deuxième partie de leur travail, les indications opératoires de la mammectomie totale avec évidement ganglionnaire de l'aisselle, dans certains cas dits avancés du cancer du sein. Ils mettent en garde contre la tendance générale à opérer pour donner une soi-disant dernière chance à la malade, alors que les signes cliniques laissent prévoir que les résultats opératoires seront nuls ou néfastes. Les bons résultats obtenus un peu partout au cours des dernières années sont attribuables en grande partie au fait que les cancers du sein sont mieux étudiés en fonction de leur opérabilité et de leur éventuelle guérison opératoire. Les auteurs notent que 36% de leurs opérés sont considérées comme gueries après cinq ans.

Ils énumèrent et étudient les nombreux facteurs ou éléments cliniques qui doivent entrer en ligne de compte pour déterminer le degré d'opérabilité.

Quelques-uns sont d'importance secondaire, d'autres d'une valeur capitale, ainsi que le démontrent leurs nombreux tableaux statistiques. On ne devrait pas dorénavant accorder à certains symptômes la mauvaise réputation qu'ils ont eue jusqu'à ce jour. L'état constitutionnel des cancéreuses, âge, gravidité, lactation, sont étudiés de même que les nombreux signes physiques des cancers: métastases, localisation, dimensions, coexistence de noyaux multiples, rougeur, envahissement et ulcération de la peau, en fonction du résultat post-opératoire.

Dans une prochaine étude, les auteurs continueront l'analyse des facteurs permettant de déterminer plus précisément les indications opératoires.

PIERRE SMITH

Obstetrics and Gynæcology

The Constitutional Type of Female Precocious Puberty with a Report of Nine Cases. Novak, E.: *Am. J. Obst. & Gyn.*, 1944, **47:** 20.

There has been little discussion in the literature concerning the constitutional type of this syndrome, probably more frequent than any other. In cases of this sort no tumour or lesion is demonstrable, nor do they manifest themselves in the later course of the patient. The clinical characters of the abnormally early puberty are identical with those of normal puberty, except for the age at which they occur. Nine cases of this sort are reported, the ages of the patient being 15 months, 2, 2-2/3, 4, 4½, 6½, 7 (2 cases) and 7½.

As to why an otherwise normal puberal mechanism is awakened at an abnormally early age, no explanation seems plausible except on chromosomal or genic basis, so that the designation, "constitutional" seems appropriate for this group.

Certainly, cases of this type are far more common than those due to granulosa cell tumours, which gynæcologists are apt to think of first in association with precocious puberty, often resorting to exploratory laparotomy in such cases. There can be no criticism on this point if there is a suspicious enlargement of the ovary. In the absence of any enlargement it is wiser to refrain from operation, though the patient should be re-examined at periodic intervals.

This study, particularly the microscopic examination of biopsies of the ovaries in several cases, has convinced the author that unlike the granulosa-cell tumour cases, those of the constitutional type may not only menstruate but also ovulate at extremely early ages, as in the remarkable cases reported from Lima, Peru, of a full-term pregnancy in a child 5 years and eight months old.

The most important practical points in the management of these cases are (1) the psychological management, to avoid the development in the child's mind of self-consciousness or a sense of inferiority or abnormality; (2) protection against the possibility of insemination. ROSS MITCHELL

Fallacies in Soft Tissue Placentography. Moir, C.: *Am. J. Obst. & Gyn.*, 1944, **47:** 198.

Serious errors of interpretation are likely to occur in the use of the soft-tissue method of placentography as originally described. Experiments show that the dark band surrounding the fetus *in utero* is the result of the subcutaneous tissue of the fetus; it does not represent amniotic fluid; the conclusions of Weintraub and Snow are in the main confirmed.

Experiments are described which prove that the uterine wall, the placenta, and the amniotic fluid are all similar in radio-opacity. A local collection of amniotic fluid (caused by an uneven position of the fetus *in utero*) gives a shadow indistinguishable on ordinary examination from placental tissue. The shapes of the shadow may give a clue to its identity, but certainly in diagnosis is seldom possible on this basis alone.

Critical examination of previous work raises doubt regarding the accuracy of the interpretation of the experimental findings. In some of the radiographs the thickness of the "placenta" considerably exceeds the thickness of the normal organ. The deep indentations frequently seen on the "placental" surface can be readily explained on the basis of the fluid nature of the shadow-producing substance.

In test cases the localized thickening of the uterine-wall shadow (the placental site according to the original definitions) disappeared when external pressure was applied. In test cases air introduced into the amniotic sac revealed a uterine wall of normal thickness at the site of the supposed placenta. Positive findings from this method of placentography should be accepted with reserve: negative findings may have a limited field of usefulness. ROSS MITCHELL

Torsion of the Pregnant Uterus. Jonas, W.: *J. Obst. & Gyn. Brit. Emp.*, 1943, **50:** 366.

In discussing the factors responsible for the origin of a pathological torsion of the uterus a distinction must be made between predisposing and initiating causes. In determining the last-mentioned in the first instance, several theories are put forward to explain the mechanism of torsion, as it occurs in pedunculated organs or tumours which may be applied to the pregnant uterus. There is a consensus that the transmission of body movements plays an important part in activating muscles or the filling degree of neighbouring organs, that is, bladder and intestines, might contribute to this mechanism. Cases taken from veterinary obstetrics in which torsion of the pregnant uterus is not infrequent, confirm this conception. In actual fact, the condition was first described by an Italian veterinary surgeon in the year 1662. It would appear, however, that the importance of the intrinsic muscles is overlooked, particularly in this case of retroverted partially fixed bicornuate uterus, where it is possible that the contractions of the non-pregnant horn might have been the main activating factor, just as in self-replacement of a retroverted pregnant uterus contractions of the muscular organ as well as the enlargement of the uterus are the main factors responsible for the eventual forward position.

P. J. KEARNS

Otolaryngology

The Treatment of Menière's Disease. Cawthorne, T. E.: *J. Laryn. & Otol.*, 1943, **58:** 363.

The treatment of Menière's disease should be approached form a conservative viewpoint and all forms of medical treatment exhausted before trying surgery. Sedatives and diuretics aid many cases, also, reduction of fluid intake. Hyoscine gr. 1/600 with hyoscyamine, gr. 1/150, given as a tablet one to three times a day is useful. If this fails then phenobarbital gr. ½, with pilocarpine gr. 1/12 may be exhibited. Inflation of the Eustachian tube and the removal of any naso-oral sepsis help a few cases. Cases which do not respond to these measures and which show marked deafness may be helped by operation. Section of the vestibular portion of the eighth nerve is recommended by some, but the author recommends drainage of the endolymphatic space. The approach is through the mastoid and then opening the external semicircular canal by the use of a dental burr under a low power binocular microscope. The transparent membranous canal is removed by forceps and the wound closed. Postoperative disturbance varies with the function present in the labyrinth preoperatively. If function was slight then the disturbance is very slight. The patient requires rehabilitation postoperatively by head and eye exercises and walking practice to eliminate unsteadiness. This unsteadiness arises after sudden head movements and is disconcerting to many patients at first. Some patients are able to return to their work in a month while others require a longer convalescence.

GUY H. FISK

Deafness Resulting from Gunfire and Explosions. Suggit, S.: *J. Laryn. & Otol.*, 1943, **58:** 313.

Three types of deafness occur from gunnery and explosions, middle ear deafness, gradual high tone loss, abrupt high tone loss. One ear may show one type and the other another in the same patient. Sixty-nine cases are discussed.

Middle ear type. Result of suction component of blast wave. Margin of perforations of ear drum everted. Patient shows a negative Rinné test. Recovery takes twenty-five days or longer and is usually complete without interference. Gradual high tone loss is seen in exposure to gunfire over a prolonged period. It is the same as occupational deafness. Permanent hearing loss develops if the exposure has been for any length of time. It is due to degeneration in the basal coil of the cochlea. Abrupt high tone loss may be produced by a single explosion. The drum is usually intact. There is a sharp drop in hearing in the higher frequencies. The condition neither progresses nor regresses with the passage of time. It is due to hæmorrhages in the region of the round window and basal coil of cochlea.

This difference in damage is thought to be dependent on whether the intrinsic ear muscles are tense or slack at the time of injury. Protection of the ears by ear plugs is unsatisfactory and some type of antiflash helmet with telephones is recommended as offering the best protection.

GUY H. FISK

Radiology

Roentgen Therapy of Pelvic Tuberculosis in the Female. McIntosh, H. C.: *Radiology*, 1944, **42:** 55.

X-ray therapy is recommended in adequately diagnosed cases of pelvic tuberculosis. Grossly diseased tubes should be removed if possible and the pelvis then irradiated to affect residual tuberculous granulations. Disease of the endometrium with minimal or no lesions in the tubes offers a good chance of success with irradiation alone. In peritonitis, x-rays are most useful in the dry form; they are useless against ascites and marked breaking down of tissue, but may be employed after these conditions have been dealt with surgically. Irradiation seems particularly effective in localized recurrences following surgery.

The dosage technique calls for 75 to 100 r, although occasionally larger doses are used. Treatments over the same field are not repeated oftener than once a week. Treatment to different fields may be given two or three times a week if the portals are small.

R. C. BURR

Angiocardiographic Analysis of the Cardiac Configuration in Rheumatic Mitral Disease. Grishman, A., Sussman, M. L. and Steinberg, M. F.: *Am. J. Roent.*, 1944, **51:** 42.

Angiocardiography has permitted an analysis of the formation of the cardiac contour during life. The multiple roentgen exposure technique, as described by Robb and Steinberg in the *American Journal of Roentgenology*, 1939, was used. Diodrast, 70%, was injected rapidly intravenously. This method has been applied to the analysis of the mitral configuration. The enlarged left atrium, which is a constant finding in mitral disease, is the most important factor in the production of this configuration. It forms a considerable portion of the right cardiac contour. In addition, the left auricle forms the lower arc of the middle left cardiac contour. The upper or cephalad arc is formed by the pulmonary artery or the left pulmonary artery, or both. The pulmonary artery is elongated and displaced anteriorly and cephalad by the left atrium, and usually is not significantly dilated. The right ventricle does not enter into the cardiac contour. Its size is not proportional to the prominence of the middle left segment which is, in fact, produced indirectly by the left atrium, displacing the pulmonary artery. The pulmonic conus is always found well within the cardiac silhouette and does not contribute to the formation of the left cardiac border.

R. C. BURR

Anæsthesia

Studies on Traumatic Shock. III. Anæsthesia in Clinical Shock. Evans, E. E.: *J. Am. M. Ass.*, 1944, **124:** 473.

The author has endeavoured to find a method of anæsthesia suitable for wounded and badly shocked patients who must undergo abdominal operation. This situation most frequently occurs in military and casualty surgery and it is imperative to use an agent that can be easily transported and readily available. Laboratory experiments in surgery on animals in induced shock have led him to the conclusion that cyclopropane or sodium pentothal intravenously are the two agents of choice. Front-line conditions do not permit the use of cyclopropane, so that his investigations have concentrated on the application of intravenous sodium pentothal.

Although pentothal is suitable for patients in shock, it is not suitable alone for intra-abdominal surgery. In these cases it is an unsafe and poorly chosen anæsthetic agent, simply because one cannot secure any reasonable relaxation of the abdominal musculature without the use of very unsafe concentrations of the drug. To obviate this, he suggests a bilateral intercostal nerve block of the 7th through to the 11th intercostal nerves in the mid-axillary line, combined with intravenous sodium pentothal in 2.5% solution. Premedication is fairly generous, morphine, gr. 1/6 or 1/7, with atropine, gr. 1/100, together with phenobarbital sodium, 3 grains, about forty minutes before the operation is scheduled to start. After the intercostal block is performed (5 c.c. of 1% procaine-epinephrine solution in each intercostal space from the 7th to the 11th on each side), a small injection of sodium pentothal (2.5% solution) is given intravenously, to produce unconsciousness, but not undue depression. The rate and depth of breathing is the best guide as to the stage of anæsthesia secured. Oxygen may be given by face mask during the pentothal anæsthesia and, if available, possibly tends to prevent the further development of shock. In most cases the author did not administer it because he believed that observations on the effect of this combined anæsthetic method without oxy-

gen therapy would more closely parallel battle conditions.

It is pointed out that this method may be used in surgery of the extremities but here local or regional anæsthesia is not required to supplement the pentothal, as it may be used as the sole anæsthetic agent since relaxation is not required.

This report is based on the use of this combined anæsthetic method in 45 patients in clinical shock on whom abdominal exploration was undertaken because of perforating stab or gunshot wounds of the abdomen or ruptured viscus from external trauma. To these are added observations on the use of sodium pentothal alone in 23 cases of skeletal injury (compound fractures of the femur or tibia). F. ARTHUR H. WILKINSON

Pædiatrics

The Mechanism of Muscle Spasm in Poliomyelitis. Kabat, H. and Knapp, M. E.: *J. Pæd.*, 1944, **24**: 123.

A fundamental innovation of the Kenny concept of poliomyelitis is the emphasis placed upon muscle spasm. It is essentially an abnormally increased tonus of the skeletal muscles which appears in the acute stage of the disease and may persist for months or years. There is no constant relationship between spasm and the paralysis caused by motor denervation. Eight clinical characteristic features of muscle spasm are described. In a number of experiments to determine the mechanism of muscle spasm in clinical cases of poliomyelitis, it was found that the spasm is relaxed temporarily by spinal anæsthesia or block of the myoneural junction. Intravenous pentothal anæsthesia decreases muscle spasm in some and is ineffective in others. Muscle spasm in poliomyelitis has a neurogenic mechanism and is apparently the result of an increased discharge of nerve impulses through the motor neurons. Evidence is presented to support the theory that the pathological basis is a lesion of internuncial neurons in the gray matter of the spinal cord.

S. J. USHER

Therapeutics

Penicillin in the Treatment of Late Cutaneous Syphilis. O'Leary, P. A. and Herrell, W. E.: *Proc. Staff Meet. Mayo Clinic*, 1944, **19**: 20.

The authors chose a patient who presented a clinical manifestation of syphilis in which the beneficial effect, if there was to be any, could be readily seen. A patient with a nodular syphiloderm of the nose was chosen. The lesion had been present for eight months. Local measures had produced no improvement.

One month after completing the course of penicillin the serological tests were unaltered. The therapeutic result so far as the syphiloderm was concerned, was pronounced. The lesion healed more rapidly and more completely than is customary after use of the various arsphenamine preparations, in lesions of the type described.

Observation of this patient for at least five years will be necessary to determine how permanent the results of treatment will be. S. R. TOWNSEND

The Treatment of Angina Pectoris. Riseman, J. E. F.: *New Eng. J. Med.*, 1943, **229**: 670.

The results of therapy in angina pectoris are difficult to evaluate. In a special clinic at the Beth Israel Hospital the results of treatment of 75 patients over a ten-year period were carefully followed. Sixty-eight different therapeutic agents were employed and their usefulness checked by repeated trials and by the use of placebos. Results were judged by the individual patient's response to the standardized exercise tolerance test of the author.

Of the 68 methods of treatment studied 20 were found to be of considerable value, 22 of slight value, and 26 only of psychological value.

The conclusions reached, as a result of this carefully controlled study, were that 27% of anginal patients respond strikingly to practically all available forms of therapy, 33% respond in a moderate degree, and 40% show no appreciable response. Nothing short of almost complete disappearance of attacks can be considered as a favourable response to any form of treatment.

The drugs of choice were found to be nitroglycerin (1/400 gr., every hour), theobromine and sodium acetate (7½ gr., four times daily), cobra venom intramuscularly, and the sedatives.

Surgery is required in few patients, although total thyroidectomy is of considerable value in a selected group and paravertebral alcohol injection gives symptomatic relief to others.

Eleven patients showed no change and, since the clinical course of angina pectoris may vary a great deal spontaneously, the authors are unable to conclude that testosterone propionate has any beneficial therapeutic result. NORMAN S. SKINNER

Pathology and Experimental Medicine

Rheumatic Pneumonia. Neuburger, K. T., Geever, E. F. and Rutledge, E. K.: *Arch. Path.*, 1944, **37**: 1.

The question of the occurence of specific rheumatic pneumonia remains unsettled at the present time, despite intensive study in recent years. In an effort to determine whether the pathological characteristics of rheumatic infection may be found in the lung, the authors reviewed the pathological material from 63 consecutive cases of active and quiescent rheumatic fever. Control material consisted of some 60 cases, comprising various types of acute pneumonia, chronic organizing pneumonia and chronic passive congestion, both uncomplicated by ordinary pneumonia. Of the 63 rheumatic cases, 8 exhibited distinctive pulmonary changes.

The clinical symptoms in the series were indefinite. Fever, cough, bloody sputum, leucocytosis (usually over 15,000) and dyspnœa, were characteristic of rheumatic infection associated with pulmonary involvement. Lack of response to sulfonamide therapy, negative bacteriological findings and non-specific roentgen changes completed the clinical and laboratory findings. The pathological features observed were revealed only on microscopic study, gross examination of the lungs failing to disclose any specific lesion. The microscopic studies revealed peculiar granulomata in the alveolar ducts and alveoli, resembling in some instances renal glomeruli; focal fibrinoid necrosis with alveolitis; fibrinous exudation within and hyaline lining membranes of alveoli; arteriolitis; mononuclear cell exudation; and septal cell proliferation.

Such lesions are identical with the *burgeons conjonctifs* of Masson *et al.* They suggest comparison with the Aschoff bodies in the myocardium characteristic of rheumatic fever, but differ in one fundamental respect. The myocardial lesions are located in the interstitial connective tissue, whereas the pulmonary granulomata, for which the authors suggest the term "Masson body", are within ducts and, in part, are intra-alveolar. Further comparison of the lesions with those of organizing pneumonia, and with other control material, lead the authors to the conclusion that the "Masson body is a fairly specific granuloma" and is, in fact, "an equivalent of the Aschoff body in the heart". E. G. HINDS

Cardiac Lesions in Arthritis. Baggenstoss, A. H. and Rosenberg, E. F.: *Arch. Path.*, 1944, **37**: 54.

The authors report two cases of multiple rheumatoid arthritis in which cardiac lesions were present, having a striking histological similarity to the subcutaneous nodules characteristic of the disease. Such lesions were present in mitral and aortic valves, visceral and parietal pericardium, and aorta. The lesion consisted

of a small granulomatous body, varying somewhat in size, but roughly spherical in shape when present in the valve ring, and elongated and band-like when observed in the leaflet. Three well-demarcated zones were noted, *viz.*, a central region of necrosis, an intermediate zone of large palisaded cells and a peripheral zone of chronic inflammatory reaction. In addition, structures similar to Aschoff bodies were noted in the myocardium and pericardium in one case, while perivascular "onion skin" scars, interpreted as healed Aschoff bodies, were present in the other. Specific staining for *T. pallidum* and *M. tuberculosis* gave negative results.

A careful comparison of the lesions with those typical of rheumatic heart disease disclosed that the only significant distinguishing feature was the larger amount of central necrosis in the former. This indicates that in some instances of rheumatoid arthritis, the heart may respond, not with a lesion usually indistinguishable from that produced by rheumatic fever, but in a manner almost identical with that of the subcutaneous nodule.

The difference, to the authors, is one of degree rather than of kind. Accordingly, they believe that the lesions may best be brought under the classification of rheumatic heart disease. E. G. HINDS

Studies on Infectious Mononucleosis. Julianelle, L. A. *et al.*: *Ann. Int. Med.*, 1944, **20:** 281.

The present communication is a report on experiments conducted to demonstrate a specific virus in infectious mononucleosis. The materials studied for transmission were blood, gargle washings, and excised lymph nodes, and the animals employed consisted mainly of rabbits, with a certain number of monkeys (*m. rhesus*) and the smaller animals. Although changes in the peripheral blood such as leucocytosis, lymphocytosis, and monocytosis, were observed with surprising regularity, it must be pointed out that the occurrence of abnormal white cells was negligible and their presence was only transient. The presence of heterophile antibody accompanying the inoculations was similarly irregular and of low frequency as well as titre.

Attempts to transmit infectious mononucleosis to man were unsuccessful. Two subjects gargled with the throat washings of one patient, and two others permitted the intramuscular injection of a saline extract of cervical lymph nodes removed from patients during the febrile period of the disease. One of the latter subjects sprayed his naso-pharynx with a portion of the saline extract. In no instance did hæmatological changes result which indicated that transmission had occurred.

S. R. TOWNSEND

Hygiene and Public Health

Primary Pulmonary Coccioidomycosis. Goldstein, D. M. and McDonald, J. B.: *J. Am. M. Ass.*, 1944, **124:** 557.

Although the pulmonary infection caused by the fungus, *Coccidioides immitis*, is limited to certain areas, notably the State of California, nevertheless the great movement of military and civilian personnel which is occurring in these times may result in cases of the disease coming to the attention of physicians not in endemic areas. Spores of the fungus are thought to contaminate the soil of some areas and to be disseminated by dust.

Primary pulmonary coccioidomycosis has a high morbidity and a low mortality rate in endemic areas. In a series of 75 soldier patients first observed by the authors none succumbed; 3 however, developed pulmonary cavitation and 3 pleuritic effusion. Except for these 6 patients all of the series returned to full field duty.

Characteristic symptoms and signs in these patients were: thoracic pain in 88%, cough in 88%, chills and fever in 66%. Physical signs were found in only 26% of the cases, chiefly "harsh rough breath sounds". Erythema nodosum occurred more frequently than reported elsewhere (in 19 of the 75 patients).

The sedimentation rate is usually elevated, the tuberculin test is either negative or positive. If negative, it was of value in excluding tuberculosis. Coccidiodin skin tests should be positive to make a diagnosis. In all the authors' cases it was positive. This test is rather comparable to the tuberculin test, that is, a negative test probably excludes the disease, but a positive test may be evidence of previous healed infection. Blood precipitin and complement fixation tests are of value if positive. Negative tests do not necessarily exclude the disease. Positive cultures may be obtained from sputum on Sabouraud's medium. X-ray of the chest is of value, although there are probably no typical findings. The x-ray picture must be assessed along with other findings.

FRANK G. PEDLEY

Ability of Different Types of Hæmolytic Streptococci to Produce Scarlet Fever. Hamburger, M., Hilles, C. H., Hamburger, V. G., Johnson, M. A. and Wallin, J. G.: *J. Am. M. Ass.*, 1944, **124:** 564.

This article reports the results of typing 672 strains of group A streptococci from soldier patients in an area where most of the cases of sore throat were hospitalized. The following table gives the different types of streptococci isolated and indicates the frequency with which scarlet fever was associated with each.

Group A type	*No. of cases*	*No. of cases with scarlet fever*	*Percentage of cases with scarlet fever*
19	189	31	16.5
1	163	7	4.3
3	75	34	46.6
6	48	0	0
17	43	14	32.5
36	27	0	0
18	17	0	0
5	16	0	0
Other types	28	4	14.3
Undetermined	66	5	7.6
Total	672	95	14.1

FRANK G. PEDLEY

Industrial Medicine

Gynæcological and Obstetrical Problems of the Industrial Physician. Burnell, M. R.: *Indust. Med.*, 1944, **13:** 211.

In the work of the industrial physician today the necessity of consultation with specialists in various fields of medical practice has for some time been recognized. During the war emergency, the enrolment in industry of large numbers of women has forced attention on gynæcological and obstetrical problems, and already many industrial physicians have realized that consideration of these must also become a part of their program.

In this article the author discusses some of the industrial medical problems that belong in the field of gynæcology and obstetrics. In presenting pre-employment gynæcological considerations the necessity for thorough examinations for the purpose of safe placement at work is emphasized. A knowledge of the prospective employees' previous health is of fundamental importance along with the pelvic examination.

Among established employees it is rare to find definite gynæcological disease arising solely from an occupational cause, but it is common to find aggravation of a previously existing condition. The problems encountered among women employees are the following: dysmenorrhœa, abnormal menstrual flow and inter-menstrual bleeding, pelvic pain and low backache, pelvic relaxations, menopause, and pregnancy.

No phase of health maintenance for women in industry has received as much attention as that concerning pregnancy. The state laws are few and inadequate, and give little guidance to an industrial physician. He can, however, obtain great assistance from recommendations prepared by the Children's Bureau, the Women's Bureau

of the United States Department of Labour and the "Committee on Health of Women in Industry" of the American Medical Association. These recommendations are summarized in the article. MARGARET H. WILTON

Control of Welding Fumes in Shipbuilding Operations.
Rosenfeld, Y.: *Indust. Med.*, 1944, **13**: 103.

The tremendous shipbuilding expansion on the Pacific Coast has given rise to a number of problems concerning electric arc welding. The major health hazards associated with this process can be classified briefly as follows: (1) Eye injuries, burns, or irritations due to the brilliant rays of the electric arc. (2) Skin injuries and burns due either to ultraviolet radiation of the electric arc or through the handling, sparks, or drops of molten metal. (3) The respiratory hazards due to the generation of poisonous gases and fumes.

This paper discusses the major fume hazards of welding operations, and the control measures which have been instituted by the Division of Industrial Hygiene of the Los Angeles City Health Department with the cooperation of some of the shipyards situated in the Los Angeles City area. Most of the discussion concerns welding on galvanized and other coated steels, where the hazard of lead and zinc fumes is very important. In welding on black iron the problem is not so acute.

Air studies for the collection and analysis of welding fumes were conducted in two major shipyards. The findings established the fact that a potential health hazard existed, and indicated the necessity of controlling the dissemination of fumes into the breathing environment of the welders.

Control experiments showed local exhaust ventilation to be the most satisfactory method of controlling the fumes. After installation of such equiment, it was found that the working time and efficiencies of the welders were very notably increased. The author also discusses the use of general supply ventilation alone where actual welding operations are being done, and the use of respirators and supplied-air welding helmets. Recommendations for respirators of any type should be made only if control by ventilation is impractical.

MARGARET H. WILTON

Obituaries

Dr. Robert Brodie Anderson died in the Winnipeg General Hospital on April 29. Born at Almonte, Ont., 69 years ago, he received his education in Winnipeg, graduating from the Manitoba Medical College in 1903. After a short term of practice at Moose Jaw he went to Edinburgh for postgraduate work. On his return he went on a tour of inspection for the Dominion Government, investigating the conditions of the Indians in the reserves on Lake Winnipeg, and later was associated in practice in Winnipeg with Dr. C. J. Jamieson and Dr. A. R. Winram. Returning to Edinburgh he received the F.R.C.S.(Edin.) diploma, and became a Fellow of the Edinburgh Obstetrical Society. After some months of study in Dublin he received the D.P.H. from Trinity College and the L.M. from Rotunda Hospital. From 1910 he followed his practice in Winnipeg until joining up for service in 1914-18.

For many years he was an elder of Old Kildonan Presbyterian Church. He is survived by his widow, a daughter, Patricia, who is in charge of the operating rooms in Winnipeg General Hospital, and three sons in the Royal Canadian Air Force.

Big-hearted, generous and kindly, Brodie Anderson had many friends both in and out of the profession.

Dr. L. N. Bourque died at Moncton, N.B., April 29, 1944, aged 92 years. He was the oldest registered physician in New Brunswick and had maintained a limited consulting practice until a few months ago. He was born at Shediac, N.B., in 1852 and graduated from Victoria Medical College. He had practised in Montreal, Richibucto, N.B., and for the last 60 years in Moncton. He was well known throughout Westmorland County and had served several years as Councillor in the City of Moncton.

Dr. Neil Alexander Christie, of Calgary, passed away on April 24, 1944, in his 62nd year. He was born in Duntroon, Ont., about ten miles from Collingwood, and after his primary and secondary education, he entered Toronto University, where he graduated in medicine in 1911. One year later he registered to practise in that province, but in 1913, the spirit of the West got him, and he came to Calgary, and opened an office. Two years later, he went overseas in the first Great War as captain with the 8th Field Ambulance; returning in 1918, when he re-opened his practice. He was associated with a classmate, in the person of Dr. Charles Bouck, and continued his general practice until his failing health compelled him to retire in 1940. He enjoyed a good family practice. Surviving are his widow, Thelma, of Calgary; a daughter, Joan, and a brother, Dr. John, of Vancouver, B.C.

Dr. Philip Yuey-Yit Chu, Toronto, Ont., died on January 18, 1944. He was born in 1898 and a graduate of Toronto University (1925).

Dr. Robert Edward Clapp died at Bruce County Hospital, Walkerton, Ont., on May 2, in his 90th year.

Dr. Clapp retired from practice at Mildmay, Ont., many years ago to become Registrar of Deeds for the County of Bruce. He is survived by two daughters, Mrs. Jef Bradford, Toronto, and Mrs. W. J. Aiken, Orangeville.

Dr. Lawrence Edmond Crowley, aged 58, well-known Kingston physician, died suddenly on April 12, at his residence. He had been slightly ill for the past few months but not seriously so and his death at this time was unexpected.

Born in Kingston, the son of Mr. and Mrs. Charles W. Crowley, he was educated at St. Mary's Separate School, Regiopolis College and Queen's University. He graduated in medicine from Queen's in the class of 1912 and interned in Springfield, Mass., and Buffalo, N.Y. He then returned to Kingston where he has practised medicine for the past 30 years.

He was attending physician at St. Mary's of the Lake Orphanage for 25 years, head of the Department of Anæsthetics at the Hotel Dieu Hospital for 24 years, served on the City Council from 1926 until 1929, was a member of the Children's Aid Society, acted as part-time physician at the Kingston Penitentiary in 1919 and was a member of the Knights of Columbus. He was Grand Knight of this organization in 1919 and in the spring of 1943 he was appointed coroner for the County of Frontenac.

Surviving are his widow, the former Lucille Dermandy, three sons, Ted and Bill at home and Jack in the R.C.A.F. at Ottawa, and one sister, Mrs. William F. Casey, Kingston.

Hon. Dr. James Albert Faulkner, Minister of Health for Ontario from 1934 to 1938, died on April 27 in the Toronto General Hospital, following a 10 days' illness. M.P.P. for West Hastings, he became Minister of Health in the first Cabinet formed by M. F. Hepburn.

At the time of his death, Dr. Faulkner held the office of chairman of the Old Age Pension and Mothers' Allowance Board.

Born in Stirling, Ont., in 1877, where he received his early education, he was the son of Dr. and Mrs. Geo. Faulkner, of U.E.L. stock. He graduated in arts from McMaster University in 1900 and four years later in medicine from McGill University. He interned at the Royal Victoria Hospital, Montreal, and engaged

in practice in Foxboro, Ont., from 1905 to 1918, when he moved to Belleville. He also maintained a home in Toronto. For 27 years he was Medical Officer of Health for Thurlow Township.

During his term of office as Minister of Health for Ontario, Dr. Faulkner was active in the fight against cancer, mental disabilities and streptococcal infections.

His wife died about a year ago and a son, Albert, was killed in a motor accident a few months ago. Surviving are two sons, Maj. George Faulkner, in service with the British forces in India, and Lieut. Farley Faulkner, with the Hastings and Prince Edward Regiment, overseas; a daughter, Nursing Sister Elizabeth Faulkner, R.C.A.F. (W.D.), at Uplands, and his mother, Mrs. F. MacTavish, Belleville.

Dr. Gordon McLelland Hanna, of Brantford, Ont., died on December 26, 1943. He was a graduate of Toronto University (1910), born in 1887.

Dr. Herman E. Hayd (formerly Heyd) died in Buffalo on February 18, 1944, at the age of 86.

Dr. Hayd was born in Brantford, Ont., on June 11, 1858. He graduated in medicine from McGill University in 1881 and spent several years in postgraduate work in England and on the Continent. He settled in Buffalo and became one of the leading surgeons of that city. He retired at the age of 70 and devoted the rest of his life to study and travel. In his retirement he wrote his autobiography and distributed copies amongst his friends.

A nephew, Dr. Chas. G. Heyd, of New York, is past president of the American Medical Association.

Dr. Everett William Henry, of Niagara Falls, N.Y., was a graduate of Queen's University (1923). After graduation he interned at Hamilton General Hospital; Lying-in Hospital, New York City; and Cook County Hospital, Chicago. Dr. Henry died March 30, in Niagara Falls, N.Y., after about 1 year's illness. He was born at Warkworth, Ont., in 1891. He served overseas 3 years during the war 1914-1918, with No. 7 Queen's Medical Unit, then transferred to the R.C.A.F. in which position he served as instructor at London, England, until the end of the war.

A brother, Major Arnold Henry, C.A.M.C., now overseas survives him, as well as his widow, formerly Helen Thompson, and his father, of Warkworth.

His life's work was one of useful service and helpful influence.

Dr. William Albert Kelly, of London, Ont., died on December 30, 1943, and a graduate of Toronto University (1900).

Dr. James St. Pierre Knight, O.B.E., of St. John's, Newfoundland, died in Montreal on April 10, 1944. Born in 1885 on the Island of St. Pierre off the South West coast of Newfoundland, he received his early education at the Old Methodist College in St. John's, Newfoundland, proceeding later to Edinburgh University, where he graduated as a gold medallist in 1910. Returning to St. John's he interned at the General Hospital, then entered private practice. Immediately upon the outbreak of war in 1914, he joined the Royal Army Medical Corps, and was commissioned as Captain in the Connaught Rangers of the 16th Irish Division. Later he was promoted Major and transferred to the Royal Newfoundland Regiment as A.D.M.S. After some years of active general practice in St. John's he was appointed Chief Medical Health Officer of the Department of Public Health and Welfare in 1934. He acted also as Superintendent of the Fever Hospital, Superintendent of the Home for Aged and Infirm, and Chief Medical Officer of the Port of St. John's. He was a prominent Mason, serving a term as Master, and also as a District Grand Lodge Officer.

Dr. Laura Merriam McLaren, of Guelph, Ont., died on February 7, 1944. She was born in 1867 and a graduate of Hahnemann Medical College, Chicago (1906).

Dr. William Ross MacRae died suddenly at his home, Whitney Pier, on April 9, 1944. He had just reached his home after a professional call when he had a cardiac seizure and death followed almost immediately.

Dr. MacRae was 70 years of age. He was born at Baddeck, N.S., and received his early education there. He graduated in Arts from Dalhousie University in 1894, and from McGill University in Medicine in 1897. For some time thereafter he practised in Baddeck. In 1900 he began practice at Whitney Pier. For many years he was on the staff of the Emergency Hospital of the Dominion Steel Company.

A man of generous sympathies, he was held in high esteem by his confrères and by the general public.

Dr. F. V. Maxwell died at his home in Saint George, N.B., April 19, 1944. He was born on March 17, 1907, and was educated at Hopewell, N.S., and Pictou Academy. He graduated from Dalhousie Medical School, interned at Halifax and did postgraduate work in Montreal and New York. He had practised in Saint George since 1931. Dr. Maxwell took a special interest in the local schools and was coroner for Charlotte County.

Dr. Albert Montgomery, of Toronto, died on April 8, 1944. He was born in 1886 and a graduate of Toronto University (1916).

Dr. Herbert Edward Moore, of Lakefield, Ont., died on December 28, 1943. He was a graduate of the University of Western Ontario (1907).

Dr. Edward Reginald Morton, Gullane, East Lothian, Scotland, died on January 21, 1944. He was a graduate of Trinity (Toronto) University (1890).

Dr. Alfred Ernest Northwood, Chatham, Ont., died on December 10, 1943. He was born in 1873 and a graduate of Toronto University (1895).

Dr. Donald Adair Parkhill, Lanark, Ont., died on October 21, 1943. He was born in 1893 and a graduate of Queen's University (1918).

Dr. Severin Sabourin died on April 29, at Bonnyville, Alta.

Dr. Sabourin was born at St. Urbain, Que., on February 18, 1886, the son of Moise and Olivine Sabourin. He took his classical education at the Seminary of Valleyfield, and graduated in Medicine from Laval University, in 1910. After a year as intern at the Hospital of Notre Dame he came west in 1911, and spent six years in Edmonton, and Lac La Biche, moving to Bonnyville in 1917, where he spent the remaining years of his life in singularly rich and full service, knowing all the hardships of pioneer medical work, with long rides on horseback, and long cold drives in winter, a familiar and well loved figure for many miles in every direction.

In 1926, on a six-months' leave of absence, he took postgraduate work in Paris, studying under such noted men as Pauchet, Duval, and Jean Louis Faure. Dr. Sabourin was Health Officer for many years in the district, and was doctor for Indian work also for many years.

A man of varied gifts, Dr. Sabourin was choir master in the church, where his wife was organist, and made a noted contribution to the musical life of the community. A keen lover of outdoor sports, a good shot, in the scanty leisure snatched from his professional duties he was a familiar figure on the lake and in the fields.

Interested in the development of the country, he was the first mayor of Bonnyville, and organized the first Chamber of Commerce. In spite of arduous professional duties he was always ready with help and counsel in matters pertaining to the welfare of the community. He was Grand Knight of the Knights of Columbus, and Medical Officer to that Lodge. His keen sense of humour, equable temper, and kindly courtesy, made him a delightful colleague, companion, and friend.

Dr. Sabourin was married in 1917 to Miss Marguerite LaRiviere, of Auburn, New England, and leaves his wife, twelve children, and a large circle of friends to mourn the loss of one who filled a large place in the community, and in the hearts of his friends.

Dr. Patrick John Scott, Southampton, Ont., died on February 6, 1944. He was born in 1865 and a graduate of Queen's University (1888).

Dr. J. C. Simpson, former dean of medicine at McGill University, who after his retirement served with the rank of captain in the Royal Canadian Army Medical Corps, died on April 20 at the Ste. Anne's Military Hospital in his 68th year. He had been ill for eight weeks.

Dr. Simpson left the Army last August when the age retirement rule was enforced, but he continued to carry on his work as joint field secretary of the Canadian Medical Procurement and Assignment Board for M.D. No. 4 in an honorary capacity.

He took over this wartime post, which involved the obtaining of sufficient medical personnel to serve military needs in this area in correlation with civilian needs in January, 1943. At the time three former deans of medicine at McGill were in uniform, including the late Col. Grant Fleming, and Brig. J. C. Meakins.

A native of Brockville, Ont., Dr. Simpson received his university training at McGill. He served on the staff for more than three decades as a teacher and administrator and won the friendship of thousands of students. He was for 18 years a member of the Board of Reference of the Canadian Intercollegiate Athletic Union and served for nine years as president of this body.

His teaching career at McGill began in 1903 when he was appointed a demonstrator in zoology, while he was still a student. He obtained his B.Sc. degree in 1907 and won a special Sir William Macdonald scholarship which took him for further studies to the marine biological station at Plymouth, England.

While there he was notified that he had won one of the famous 1851 Exhibition scholarships which took him to Emmanuel College, Cambridge. Other awards enabled him to travel widely on the continent. He returned to McGill in 1909 and the following year he was placed in charge of the newly created department of biology and embryology with the status of associate professor.

He was promoted to a full professorship in 1928 and remained with the department until 1936, when he was made associate dean of medicine, having served as secretary of the faculty since 1922. In 1940 he was made dean and at the end of the following session he was retired.

Fired more with determination than with physical powers, he was called upon to play an important part in university athletics by the late Sir Arthur Currie who early in his principalship summoned Dr. Simpson to his office and told him he was the nominee not only of the principal but also of the students to the newly-formed Students' Athletic Council. When Sir Arthur died, Dr. Simpson was asked to take the chairmanship of this body. He was called into the national scene by the C.I.A.U., which he subsequently headed.

He was in uniform in two wars. In 1914 he joined the McGill C.O.T.C. and a year later was given the post of adjutant with the unit. From 1917 to 1919 he served as a Military Service Act Officer attached to M.D. No. 4.

Dr. Simpson is survived by his widow, formerly Miss Ethel Roberts; one son, James A. Simpson, and a daughter, Miss Marjorie Simpson.

Dr. B. N. Sinclair, of Trinity, Newfoundland, passed away on December 31, 1943, in his seventieth year. Graduating from Edinburgh University in 1895, he had practised in Newfoundland for twenty-five years.

Dr. Clarence Wm. Thorne died on April 26 at the Saskatoon City Hospital, aged 49.

Born at Grandville Ferry, Nova Scotia, Dr. Thorne graduated from Dalhousie University in 1918, and interned in Victoria Hospital, Halifax. He took obstetrical training at New York Methodist Hospital, Brooklyn, N.Y. He was a Fellow of the American College of Surgeons, and also attended Edinburgh University in 1936.

He served in the Canadian Army Medical Corps with the rank of lieutenant, and on April 28, 1919, he married Nursing Sister Roberta Anderson at Camp Hill. Besides his widow he is survived by two daughters Sybil and Dorothy, and a son Robert. A sister, Mrs. John Armstrong resides in Liverpool, Nova Scotia.

At the time of his death, Dr. Thorne was president of the Medical Staff of the Saskatoon City Hospital. He was a member of the executive of the Saskatoon Canadian Club, and a member of Saskatoon Imperial Masonic Lodge, and Past Master of Melfort Masonic Lodge. Although in practice in Saskatoon only since 1936 he had become one of the outstanding surgeons of this city. He was noted not only for his skill in surgery but also for his outstanding friendliness, cheerfulness and good humour. His loss is keenly felt by his colleagues and all other associates.

Dr. Silvio Louis Valeriote, assistant to the District Medical Officer at Headquarters M.D. No. 1, and former rugby star of the University of Western Ontario, died at his home on May 2.

A native of Guelph, Major Valeriote graduated from the University of Western Ontario Medical School (1933). He was a member of the Western football team which captured the intercollegiate championship in the early 30's, and took part in athletics at the university for several seasons.

Major Valeriote practised medicine in Guelph for several years before enlisting shortly after the outbreak of war. He served as assistant on the D.M.O.'s staff until 1941, when he left London to go overseas as second-in-command of the 15th Field Ambulance. But ill health forced him to leave his unit at Valcartier and he returned to his home district.

Dr. Thomas William Herbert Young, of Peterborough, Ont., died on April 13, 1944. He was born in 1863 and a graduate of Trinity University (1894).

News Items

Alberta

The Department of Health, which has organized travelling clinics, which operated in outlying districts, will not be able to do any work this year, owing to the difficulty of getting extra men for the purpose.

Dr. R. B. Francis, who has been one of the Alberta representatives on the Medical Council of Canada, has resigned. Dr. T. H. Field of Edmonton, has been appointed to fill in his unexpired term.

Dr. George H. Malcolmson, who had been head of the Cancer Services for the Province, since their inauguration, having passed away, the Alberta Government endeavoured to get his son, a well-trained radiologist, to take his place. The son being in the Forces overseas, and rendering outstanding services, could not be released. The profession in Alberta suggested to the Government that while it was absolutely necessary to have a well-trained radiologist on the Provincial Cancer Diagnostic Clinic, it was not necessary that the chief of the hospital services should be a radiologist. It was essential that the head of the services be a man of wide experience, and clinical knowledge in the matter of cancer, and such a one might be a radiologist, an internist, or a surgeon. The Council recently went on record that in any health insurance scheme, adopted by the Federal Government, it should be so arranged that the medical men in the Forces would in no way be handicapped when they returned to civilian life.

Before this appears in print, the "refresher" course under the auspices of the Provincial Association and the Faculty of Medicine of the University of Alberta, will be a thing of the past. Special attention is being given to the needs of men in the Forces and all are urged to attend. The Council of the College of Physicians and Surgeons is bearing the necessary expenses, and consequently there will be no fee to those who attend. Arrangements have been made to have Dr. A. E. Walker, Professor of Neurosurgery of the University of Chicago, as one of the clinical speakers. The program is a good one and a large attendance is anticipated.

No arrangements have yet been completed between the Provincial and Federal governments for the use of medical men in the Forces doing civilian practice as a temporary measure, but something is expected shortly. While there are over 50 places vacant in the Province, they could use 25 men immediately where the need of their services is very great.

It has been suggested by one province that when a college refuses an enabling certificate to an applicant and reports the action to the other provinces, all others should act similarly. The Alberta Council felt that while one province might have good reasons for refusing enabling certificates, the same reason might not be valid elsewhere, but believed it was a good idea when any person was refused an enabling certificate, the province refusing should advise all other colleges.

G. E. LEARMONTH

British Columbia

The annual meeting of the Vancouver Medical Association was held on Tuesday, May 2, at which time the officers for the ensuing year were elected: President, Dr. H. H. Pitts; Vice-President, Dr. F. A. Turnbull; Honorary Treasurer, Dr. Gordon Burke; Honorary Secretary, Dr. J. A. McLean; Members of Executive Committee, Drs. G. A. Davidson and J. R. Davies, Dr. A. E. Trites, Past-President.

Major A. H. Jukes, D.S.O., O.B.E., addressed the meeting on "The Doctor's Dilemma" as seen by a layman who is also a farmer and feels that the problems of the medical profession and those of the farmer have a certain similarity as regards post-war adjustment. The paper was interesting and well received.

At the annual meeting of the Council of the College of Physicians and Surgeons held on May 1, the following were elected as officers: President, Dr. H. H. Milburn; Vice-President, Dr. F. M. Auld, Honorary Treasurer, Dr. G. S. Purvis.

The graduation ceremonies of both St. Paul's and the Vancouver General Hospitals were recently held and record numbers of nurses were given their diploma. St. Paul's Hospital, which celebrates its fiftieth anniversary of establishment in Vancouver this year, had the honour of presenting two graduates who came first and second respectively in the provincial R.N. examinations, Miss Suzanne M. Hart and Miss Marion Abercrombie.

At the graduation ceremonies of the Vancouver General Hospital, one of whose graduates came third in the list, the urgent need of a new nurses' home was strongly stressed by many speakers. Present housing conditions for nurses at this institution are disgraceful and we understand that no further building will be undertaken by the hospital until a modern nurses' home has been provided.

The Convocation of the University of British Columbia was held in the Hotel Vancouver on May 12. The Convocation address was delivered by Mr. W. H. Woods, Commissioned Gunner of the Royal Navy, who spoke on "The Work of the Light Naval Forces in the Mediterranean Theatre".

This was the last Convocation at which President L. S. Klinck, who has served the University so well for many years, presided.

The University has undertaken the publication of a new journal, *The Graduate Chronicle*, which will be the voice of the graduates of the University of British Columbia.

It has been decided to form a society to be known as the Kamloops and District Medical Society.

Dr. M. G. Archibald of Kamloops has been selected as Senior Member from British Columbia in the Canadian Medical Association.

J. H. MACDERMOT

Manitoba

Major Norman L. Elvin, R.C.A.M.C., of Winnipeg, has recently been made an officer of the Most Excellent Order of the British Empire. Joining in December, 1939, he went overseas in January, 1941, as ophthalmologist with No. 5 Canadian General Hospital. His citation reads: "Leading a unit advance party to a location in Catania, Sicily, he found the site in a deplorable state owing to pillage. He arranged employment of native labour and supervised reclaiming work. As a result the hospital was able to open on time and give service to 500 patients requiring immediate care."

Lieut. Katharine I. McDole, R.C.A.M.C., Elgin, Man., a dietitian, was made an Associate of the Royal Red Cross for services in Sicily.

Dr. Alexander Gibson, of Winnipeg, has returned from Scotland where he was chief surgeon of the Canadian Orthopædic unit, organized by the Red Cross under the Scottish Department of Health at East Kilbride, Lanarkshire. Dr. Gibson spent eight months in Scotland.

Selkirk General Hospital, which has been in financial difficulties, has been reorganized. Under recently passed legislation a working capital of $1,500 was voted, the town of Selkirk being responsible for 50% of the amount, and the municipalities of St. Clements and St. Andrews for 25% each. The members of the newly formed inter-municipal board are Mayor William Berrisford, Councillors F. Schofield and S. Oliver, Selkirk; Reeve C. E. Fillmore and Councillor J. E. Harriott, St. Andrews municipality; Reeve Russell Burnett and Councillor A. A. Verheuil, St. Clements municipality. ROSS MITCHELL

New Brunswick

The need for more bed accommodation for cases of tuberculosis was stressed at the monthly meeting of the Board of Commissioners of the Saint John Tuberculosis Hospital on April 11. Dr. R. J. Collins, Superintendent, stated that the hospital was over full and there was a waiting list of 77 on record. The number of cases of tuberculosis found in the armed forces by the initial x-ray chest survey and frequent check up accounted for some of these and it is apparent that if tuberculosis is to be eradicated there is a great need for post-war building of sanatoria to supply the needed bed capacity.

From Saint John lately several physicians have made short excursions to the United States and Upper Canada to attend specialist society meetings and to visit hospital centres for special study. Among these were Drs. J. K. Sullivan, R. T. Hayes, E. W. Lunney, G. Skinner and A. E. Macaulay. A. S. KIRKLAND

Nova Scotia

During the month of April a conference was held under the auspices of the Department of Public Health of all its Divisional Health Officers, Public Health Nurses, Pathologists and other physicians making up the Department. The two day sessions were aimed at correlating the efforts of those engaged in field work with those in central authority and with one another. Conferences of this sort have been held before, but not on such a large scale. It is anticipated that very beneficial results will follow.

Dr. Fred J. Barton, of New Waterford, was forced by illness to discontinue practice for a time and enter hospital for treatment.

A recent letter from England brings the good news that Dr. John Cameron, formerly Professor of Anatomy at Dalhousie University, is enjoying excellent health and recently spent a week with the officers of No. 7 General Hospital, many of whom were his former students.

Dr. M. D. Morrison, of Halifax, recently assisted in the presentation ceremony to the Premier of Nova Scotia, Honourable A. S. MacMillan, of the Chieftainship of the Scottish Clans in the Province. Dr. Morrison is the Chief of the Morrison Clan and takes a keen interest in the promotion of the Celtic language, lore and literature.

Dr. Gerald Morson for the past several months has been ship surgeon with the Furness Withy Steamship Company, but has recently established practice in Louisburg.

The many friends of Dr. Fabian Bates, formerly practising in Glace Bay, are glad to see him back from overseas for a period of rest and recuperation from illness. H. L. SCAMMELL

Ontario

The Academy of Medicine, Toronto, held its annual meeting on May 2. Dr. John Z. Gillies was elected President and Professor William Boyd Vice-President. Dr. H. E. Hopkins and Dr. Roy Thomas were elected as Secretary and Treasurer respectively. Two hundred Fellows are serving in the armed forces and the total membership stands at twelve hundred.

The new south pavilion of Toronto East General Hospital has been taken over in part by the Department of Pensions and National Health. Four floors are now occupied by patients transferred from Christie Street Hospital, in which overcrowding was becoming serious.

Col. A. R. Hagerman who has been on sick leave for several months has gone to Britain on a special assignment.

Col. F. R. Hassard, O.C. Toronto Military Hospital has been promoted to full colonelcy.

Major A. J. Bromley is now in command of No. 2 Company R.C.A.M.C. at headquarters M.D. 2.

Lt.-Col. Glendinning, of Hamilton, has returned from Britain. Major J. R. Calder, of Brantford, has returned from Britain. Both he and Lt.-Col Glendinning are on duty with the R.C.A.M.C. M. H. V. CAMERON

Saskatchewan

Three Saskatchewan doctors have been released from active service and have returned to civilian practice in the Province; Dr. C. W. Forsyth has returned to his practice at Viceroy, Dr. W. D. Brace has located at Scott and a new registrant, Dr. George R. Hancock, McGill '39, is now associated with Dr. J. B. Routledge of Unity.

The Medical Council and profession as a whole sincerely regret losing one of their number, Dr. R. A. Dick of Canora, who is retiring to the West Coast on an extended holiday because of his health. Fellow medical men from all corners of the Province offer their sincere best wishes to Dr. and Mrs. Dick with the hope that before long Dr. Dick will regain his health sufficiently to resume some of his professional duties.

Other doctors to leave the Province include, Dr. W. Auerbach, formerly of Saltcoats, who left on May 1 for British Columbia; and Dr. A. B. King, formerly associated with Dr. J. F. C. Anderson of Saskatoon and Dr. J. B. Routledge of Unity, who is doing postgraduate work at the University Hospital in Edmonton. H. D. HART

General

The American Congress of Physical Therapy.—Will hold its 23rd annual scientific and clinical session September 6 to 9, at the Hotel Statler, Cleveland, Ohio. Rehabilitation is in the spotlight today. Physical therapy plays an important part in this work. The annual instruction course will be held from 8.00 to 10.30 a.m., and from 1.00 to 2.00 p.m. during the days of September 6, 7 and 8. The scientific and clinical sessions will be given on the remaining portions of these days and evenings. All of these sessions will be open to the members of the regular medical profession and their qualified aids. For information concerning the instruction course and program of the convention proper, address the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago 2, Illinois.

Book Reviews

Hypertension, a Manual for Patients with High Blood Pressure. I. H. Page. 80 pp., illust. $2.00. Thomas, Springfield, Ill.; Ryerson Press, Toronto, 1943.

This, an admirable little book, by the well-known Director of the Lilly Clinic at Indianapolis is designed for the benefit of the layman, but the physician will himself, at times, be able to cull from it some valuable hints. The layman receives useful instruction, which will enable him to regulate his own behaviour on a sound basis until such time as he can obtain the advice of his own doctor.

Outlines of Industrial Medicine, Legislation and Hygiene. J. Burnet. 87 pp. Wright & Sons, Bristol, 1943.

This is a short book of 87 pages which has a very ambitious coverage, attempting to deal with poisons, industrial medicine and surgery, skin diseases, legislation, and personal and factory hygiene. It is not quite clear what the purpose of this book is, since anyone particularly interested in the subject, even the part-time industrial physician, would really require more information than is found in it.

As a bird's-eye view of the subject it is reasonably good, except that it fails to discuss what is actually the most important part of industrial medicine and that is the industrial medical department.

Textbook of Gynæcology (Forsdike). J. H. Peel. 440 pp., illust. 21s. Heinemann, London, Eng., 1943.

This book is a revision of the late Mr. Forsdike's Textbook of Gynæcology. In bringing it up-to-date, due importance is given to the hormonal factor in the understanding of the physiology of the female reproductive system and the author discusses many disorders from that point of view—dysfunction, uterine hæmorrhage, amenorrhœa, menopausal symptoms, sterility, habitual abortion, leukoplakia, kraurosis vulvæ. He devotes an appendix to endocrine preparations.

Malignant growths of the genital organs are thoroughly described. The League of Nations' staging of cancer of the cervix is outlined. Contrary to the almost universal acceptance of radiological treatment for cancer of the cervix, the author recommends surgery where the patient is a good surgical risk and the growth is operable (stage 1 and some of stages 2 and 3) rather than "submit her to the unknown and unpredictable results of radium therapy". Nevertheless, he includes in his chapter on "Radium therapy" details of the applications of radium as carried out in the Curie Institute of Paris and in the Radiumhemmet at Stockholm. Similarly, his recommendation for treatment of cancer of the corpus uteri relegates radiological treatment to those cases made non-operable either by poor general physical condition or by extent of disease. No mention is made of the intracavity application of radium, placed in small individual metal capsules, a technique used so successfully in Stockholm.

There is a pleasant continuity of careful presentation throughout the pages, enhanced by fine illustrations which reach a peak of perfection in the chapter on Gynæcological Operations. A chapter on gynæcological symptoms which is inserted appropriately late in the book is in the nature of a review of gynæcological conditions based on complaints, and as such should prove to be a useful arrangement of knowledge in the important question of diagnosis.

Backache and Sciatic Neuritis. P. Lewin. 745 pp., illust. $11.50. Lea & Febiger, Phila.; Macmillan, Toronto, 1943.

In the preface, Dr. Lewin states that this book gives the general practitioner the facts needed in the diagnosis and treatment of backache and sciatica and related conditions. It certainly does, as it is really an encyclopædia on spinal and allied problems. Newer ideas on the intervertebral disc syndromes, anterior poliomyelitis, and spinal neuroses are included, with special attention to the relation of the many back problems to industrial and military service. There is hardly an aspect of the subject left untouched.

This work serves the purpose of accumulating the mass of facts known about the subject, but is certainly not a text that the general practitioner can pick up and readily read, chapter after chapter, for guidance in this difficult subject. The reviewer does not know of such a book. Rather, this book is one for reference on particular points and will be of especial interest to industrial, military, orthopædic and other surgeons or medical men dealing with many of these cases and possessing considerable training and knowledge.

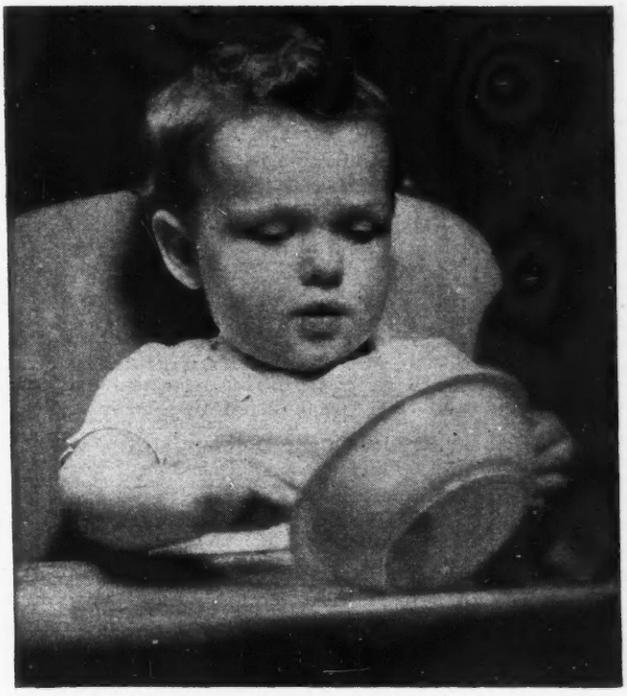
The Hospital in Modern Society. Edited by A. C. Bachmeyer and G. Hartman. 768 pp. $5.00. Commonwealth Fund, N.Y., 1943.

This volume is really a compilation of 145 articles on various aspects of hospital activity and the relationship of such to medicine, public health, law, sociology and psychology. Some ninety-eight authors, mostly recognized authorities on their subjects, in the United States and Canada, have contributed these articles selected after a careful review of recent hospital literature. Amongst these we note Dr. Harvey Agnew writing on "Personality and Psychology in the Hospital" and "The Advisory Board for Medical Specialties and its Relationship to the Hospitals"; Dr. J. C. Mackenzie on "Nursing an Endowment", and G. F. Stephens, Jr., R.C.A.F., on "Laundry Forms and Reforms". Other topics include hospital service, organization and management, the trustee, the administrator, the medical staff, nursing education and service, the operating room, the outpatient department, medical social service, records, finance, legal aspects, construction, personnel relations, public relations, health insurance, public health and many others. The authors have long been leaders in the hospital field, holding many honours and various appointments. This experience has enabled them to exercise sound judgment in their selection of articles for this volume. Of additional value is the inclusion of a selected list of references to the literature after each chapter.

Endocrine Disorders in Childhood and Adolescence. H. S. Le Marquand and F. H. W. Tozer. 298 pp., illust. 15s. Hodder and Stoughton, London, Eng., 1943.

There exists a real need for an authoritative book on endocrinology for the early years of life. Certainly most of the endocrine disturbances show manifestations during this very important age period, and many cases are overlooked to the great detriment of the patients. Unfortunately changes take place which cannot entirely be overcome due to tardy diagnoses. For example it is surprising to find so many neglected cases of hypothyroidism in children.

This book will serve as a very useful guide for all physicians interested in child endocrinology. It is written in a way which should be understandable and instructive to every medical man, and the classification and sequence of relationship in the endocrine chain is presented in a concise scientific manner. There are a number of very useful charts and measurement tables which present much useful information which is often difficult for the physician to obtain without laborious reading. If one were to offer a criticism it would be that the exigencies of war have restricted the illustrations which are so instructive in any book on endocrinology. However this book in a small readable volume covers, in an admirable way, a vast field which still requires much exploration. One has no hesitation in placing it among the essential books for the library of the enquiring practising physicians.



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Atlas of Anatomy. J. C. B. Grant. Vol. 2, 184 pp., illust. $5.75. Williams & Wilkins, Baltimore; University of Toronto Press, Toronto, 1943.

This is the concluding volume of the atlas of which the first volume was reviewed on page 296 of the March, 1944, issue of the *Journal*. The present volume contains illustrations of vertebræ and vertebral column (34), thorax (60), head and neck (138). It has the same good qualities (accurate and lucid drawings, well arranged labels, useful explanatory notes) as its companion volume, and it raises the same question—how, without unduly raising the price, it might be made, for the general practitioner or surgeon, more than simply a supplement to one of the larger and abundantly illustrated textbooks or atlases. Several of its pictures, such as those of the tonsil bed, illustrate fields which, despite their common surgical importance, many books of anatomy and surgery depict poorly or not at all. This gives point to a suggestion made by a colleague of the present reviewer, that Professor Grant could make a valuable contribution by issuing an anatomical atlas of common surgical procedures.

Fractures and Joint Injuries. R. Watson-Jones. 2 vols., 3rd ed., 960 pp., illust. $22.50. E. & S. Livingstone, Edinburgh; Macmillan, Toronto, 1943.

In general the text of this work has been brought up to date with present day procedures as a result of the author's experience in handling modern battle and air-raid casualties. The illustrations and diagrams are of the same high standard as in previous editions. There are several hundred more of them, however, including many excellent coloured ones.

The greater part of Volume 1 is devoted to the principles of fracture treatment which has always been such an outstanding feature of previous editions. Of the remaining text, injuries of the carpal scaphoid and lesions of the shoulder joint seem to be particularly well presented. With the great increase of these lesions due to the war, it behooves us to be on our toes in regard to them so that an accurate diagnosis can be made and early treatment instituted. Chapters on unusual and instructive cases and on rehabilitation bring Volume 2 to a close.

The outstanding characteristic of this book is the way in which the ultimate restoration of function is continually being kept in front of the reader. One is never allowed to forget it. Besides making a good reduction of a fracture and carrying out adequate fixation, one is constantly enjoined to keep the muscles exercised and the joints mobilized from the very beginning of the treatment. And above all, this must be done by active and not passive movement.

This book is recommended to all those whose duties require them to undertake the care of fractures and joint injuries and will be particularly useful to the medical officers of the various services.

Reconstructive Surgery of the Eyelids. W. L. Hughes. 160 pp., illust. $4.60. Mosby, St. Louis, Mo.; McAinsh, Toronto, 1943.

This book is a timely and authoritative contribution to a difficult branch of plastic surgery and will be welcomed by ophthalmic and plastic surgeons. It is well-written, well-illustrated, and provides a broad historical introduction and a comprehensive review of the literature. Unfortunately it is a monograph and even more limited in its scope than the title would indicate. As the author states in his preface, his work was presented as a thesis for admission to the American Ophthalmological Society and represents the evolution of methods for the reconstruction of new lids along with a historical review of the previous methods. It illustrates the repair of various deformities resulting from accidental or surgical absence of all or portions of the lower and upper lids. In these respects it is quite exhaustive and concludes with the author's excellent contribution to the subject of many well-illustrated cases depicting his methods. This monograph leaves the reviewer grateful for the subject matter presented and with a hope that it will form probably Chapters One and Ten of a larger volume that will deal as carefully with ectropion, entropion, epicanthus, ptosis, and the other distressing problems of orbital plastic surgery.

Internal Medicine in General Practice. R. P. McCombs. 694 pp., illust. $8.00. Saunders, Phila.; McAinsh, Toronto, 1943.

This publication is to be welcomed in these days of limited reading time. The author deals in clear but somewhat dogmatic fashion with the essential features of disease involving the various body systems. Detailed descriptions are necessarily limited but the important facts of medicine are well described in a very readable style. The newer developments of the past few years are discussed.

The book includes a number of well chosen illustrations, and the size of type makes for easy reading. This book is to be recommended and will prove of value to the general practitioner or medical officer.

White Blood Cells Differential Tables. T. R. Waugh. 126 pp., $1.60. Appleton-Century, New York, 1943.

This volume is a compilation of tables which facilitate the transformation of leucocyte percentages into absolute numbers.

Surgical Errors and Safeguards. M. Thorek. 4th ed., 1085 pp., illust. $17.50. Lippincott, Montreal, 1943.

Surgeons will everywhere welcome a new edition of Thorek's well known volume, especially one so completely revised and brought up to date. The older surgeon, who has already made most of his mistakes at least once, will not fail to find interest in this account of errors, if only to recall similar cases of his own. The younger man should study it for the humility it may bring him. In his latest preface the author has stated what might be written on the brow of many, too many, surgeons. "In this age of co-operation in the science of healing, the surgeon who fears loss of prestige through acknowledgment of fault violates not only faith in himself, but is also unjust to his calling".

This edition includes a new chapter on legal responsibility for surgical practice. It deals with circumstances in which a surgeon, perhaps only through unawaredness of his legal duty, renders himself liable to civil action. This section is better written than the main text and consequently makes easier reading. It is an absorbing chapter and undoubtedly contains information of greatest value to the practitioner as well as being an attractive addition to the volume.

There are errors both of omission and commission in this book of errors. In describing thoracoplasty for pulmonary tuberculosis the author omits one of the essential safeguards against poor results: the removal of the transverse processes of the vertebræ. This is a procedure always done by modern thoracic surgeons. The x-ray on page 269, which purports to illustrate bilateral cervical ribs, cannot be distinguished from an x-ray of a normal chest and the ribs indicated are probably first ribs and not cervical ribs.

Psychosomatic Diagnosis. F. Dunbar. 741 pp. $7.50. P. B. Hoeber, New York, 1943.

The practitioner of medicine has in recent years become increasingly aware of the fact that in order to treat his patients adequately he must take into consideration the importance of the emotional factor in the development of certain diseases. He will therefore welcome this attempt to appraise the influence of certain psychological factors which produce illness in many patients. The author has had extensive clinical experience in working for a number of years with patients in a general hospital and the material presented in this book is essentially the result of numer-

ous investigations of both the physical and psychic components in certain disease processes. Emphasis is placed on the importance of taking an adequate psychosomatic history and on the examination techniques which are essential requisites in order to bring to light personality problems which may be related to the specific illness involved. Special chapters are devoted to a consideration of the psychic aspects of fractures, various types of cardiovascular disease, rheumatic disease and diabetes. The concluding chapter is devoted to a consideration of the basic principles involved in psychosomatic diagnosis with a review of those therapeutic procedures which can bring about best results in patients who do not respond to the usual methods of treatment. The clarity with which this rather complicated problem is dealt, the use of numerous case history illustrations and the fact that the recommended therapeutic methods are essentially applicable to patients who have physical complaints will make this book particularly valuable to the general practitioner.

The Arthropathies, A Handbook of Roentgen Diagnosis. Edited by A. A. de Lorimier. 319 pp., illust. $5.50. Year Book Publishers, Chicago, 1943.

This treatise on diseases of joints covers the field very completely. The various types of arthritis are grouped in a most interesting fashion and associated diseases are also discussed. These include rickets, scurvy and various osteochondropathies including Perthes' disease, osteochondritis dissecans, etc. Neuroarthropathies are dealt with under two headings, efferent and afferent nerve loss. The book is divided into two parts, the first on peripheral joints and the second on joints of the spine. Each subject is dealt with rather briefly under the following headings: synonyms, roentgen criteria, early stages and late stages, and under each of these criteria is listed the four main points (1) soft tissues; (2) regional bones; (3) articular cortexes; (4) joint space. A special paragraph is headed "corroborative roentgen criteria" in which is listed other x-ray evidence, *e.g.*, the appearance of bones and joints in other parts of the body. The remaining headings are incidence, history, physical findings, laboratory findings and clinical course. The author has emphasized the need for the radiologist to know more than simply the x-ray appearance and has, therefore, included these other points. This same brief but complete outline of the subject is used for various disease entities. An extensive bibliography is included at the end of each chapter. The book is richly supplied with x-ray reproductions so that all the diagnostic details discussed in the text are marked on actual films by a system of arrows which leave no doubt as to the part referred to. It is evident that the films have suffered a little in the course of printing for the trabecular detail is not well shown. However, this has not interfered greatly with their usefulness.

This text is highly recommended for teacher and student. It presents a very lucid approach to a rather complicated subject.

Office Treatment of the Nose, Throat and Ear. A. R. Hollender. 480 pp., illust. $5.00. Year Book Publishers, Chicago, Ill., 1943.

This book deals with office and home treatment in otolaryngology and covers this part of the specialty quite thoroughly. The author stresses not only the local treatment but also the importance of ear, nose and throat diseases in relation to general medicine. He has, therefore, included chapters on immunization, endocrinotherapy and nutritional management. He is an enthusiastic advocate of physical therapeutic agents such as infra-red radiation and diathermy. There is a short chapter on this subject and these procedures are also frequently recommended in subsequent chapters in conjunction with other treatment. Regardless of the objections raised by other authors, iontophoresis (zinc-ion transfer) is recommended in those cases of nasal allergy in which a prolonged treatment with specific immunization has proved a failure. Cauterization of enlarged turbinates by the galvanocautery is condemned on account of the destruction of mucous membrane and, instead, submucous electrocoagulation is suggested.

Considerable space is devoted to the treatment of acute and chronic nasal sinusitis and the importance of conservative measures is stressed. Antral lavage is recommend in certain cases but should be used "not too early" and "not too frequently". The use of the sulfonamide drugs to abort suppurative otitis media is not recommended and this author does not feel that they should be used until middle ear drainage has been established.

Although much of the material in this book has appeared in the literature in the past, it is helpful to have it condensed into one volume and it should be of value especially to the practitioner starting in the practice of otolaryngology.

Pathology and Therapy of Rheumatic Fever. L. Lichtwitz. 211 pp., illust. $4.75. Grune and Stratton, New York, 1944.

The author has approached the subject of rheumatic fever from a viewpoint different from the many volumes already written on this disease. He has classified all types of rheumatism under this one heading, although each is discussed separately in good sequence.

The opening paragraph, "Rheumatic Fever is a non-infectious disease", rather startles one when so many previous volumes have harped so repeatedly on acute and chronic foci of infection as being the underlying infective cause. This book attempts to point out that the condition is rather of an allergic response to the presence of both bacterial and non-bacterial antigens. This statement in itself will evoke pleasure in the hearts of those whose medical attitude sees many explanations of disease from the allergic viewpoint.

The book reviews the entire subject rather briefly. Acute rheumatic fever, the most significant of the entire group, receives the most attention. It is felt that the other subjects of this group are dealt with too briefly.

In the reviewer's estimation, the section on therapy is far too brief. One turns to these chapters with a feeling of anticipation that from the author's wide experience some new hope of a therapeutic nature may be found. Unfortunately, only a brief review of past attempts at improving the lot of these poor unfortunates is given.

This book is an excellent review of rheumatic fever and the numerous references speak encouragingly of the enormous amount of reading and thought given by the author in the preparation of this volume.

Applied Dietetics. F. Stern. 2nd ed., 265 pp. $5.75. Williams & Wilkins, Baltimore; University of Toronto Press, 1943.

The author has had a great deal of experience in the Food Clinic of the Boston Dispensary, whose function is to help outpatients to understand and to follow the diets prescrbed by their physicians. In the present edition the numerous tables showing the food values of average servings of foods, etc., have been brought up to date by the inclusion of recent figures on their vitamin content. These tables should be very valuable to hospital dietitians, nutritionists and to internists who are especially interested in dietetics. The chapter on the education of the patient on the normal diet contains considerable material which should be helpful to those engaged in nutrition education. The book has been written with great care and only one relatively unimportant error was discovered by the present reviewer. It is however fairly technical and contains much detail which would be of little interest or value to the busy practitioner.